THE IRON TRADE REVIEW

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Enthusiasm Helps Iron Business

But is Not the Only Favorable Factor in Improvement—Better Domestic Demand—Many Orders From Abroad

COMPETITORS and customers of the Steel Corporation heartily approve the decision in the dissolution suit and the enthusiasm thus generated has had a stimulating effect on general conditions. The trade is, however, looking at the decision broadly as to its far-reaching effects and is not expecting immediate effects to be large orders. Entirely aside from the decision, there is decided improvement in most lines. The demand for war materials and for machinery for their manufacture continues very active and in the case of machinery, particularly lathes, orders are limited only to the ability of the manufacturers to fill them. Domestic demand shows very fair improvement.

The report that the General Electric Co. is about to place a tremendous order for shells for the allies through J. P. Morgan & Co. seems to be well founded and generally accepted statements are that the order will amount to about $100,000,000. The entrance of Italy as a belligerent has resulted in a heavy increase in demand for shrapnel and other munitions.

Railroad Buying

Orders for cars, pending or placed, have greatly strengthened the position of steel plants and have had a tendency to make prices firmer. While it is understood that the order for 15,000 cars for Russia will not be formally signed until Saturday, there is excellent reason for believing that the distribution will be as follows: American Car & Foundry Co., 2,000; Canadian Car & Foundry Co., 2,000; Easton Car & Construction Co., 2,000; Nova Scotia Car Co., 2,000, and the Pressed Steel Car Co., 7,000. The cars will involve about 200,000 tons of steel, not including wheels and axles, which will require 60,000 tons. An inquiry for 5,000 cars for France is pending.

Pig Iron

The Lukens Iron & Steel Co. has bought from 30,000 to 35,000 tons additional of basic pig iron and the market in eastern Pennsylvania seems to be pretty well established at $13.75, delivered. In most parts of the country, foundry iron is very quiet. Prices of southern grades are somewhat weaker. Eastern Pennsylvania makers of low phosphorus pig iron have been shipping heavily. In spite of the continued dullness in the pig iron market, there is greater confidence among makers in the future and many believe that higher prices will prevail.

Bars

Although reports of some concessions in prices of steel bars for delivery during the last half of the year are heard in eastern territory, the bar situation, as a whole, is strong and mills are stubbornly resisting the efforts of agricultural implement manufacturers to contract for one year, beginning July 1, instead of for only six months, as proposed by the mills.

Ferro Manganese

An eastern Pennsylvania steel company has purchased an additional block of Brazilian manganese ore suitable for the manufacture of ferro-manganese. This ore is now quoted about 15 cents per unit higher than before war was declared in Europe. The price of ferro-manganese for spot delivery has been advanced $15 per ton and is now quoted at $115. Shipments are being made from England very slowly and it is evident that English makers are conserving their supplies.

Plates

Many projects for the building of vessels at Atlantic coast yards are pending and an additional ship for the Munson lines has been placed with the Maryland Steel Co. An eastern shipbuilder estimates that contracts amounting to $20,000,000 are in sight. One large ship yard is filled with work until a year from next October.

Wire

Wire mills are extremely busy. Heavy demand is coming from the domestic trade and cables from many parts of the world are being received indicating that the demand for wire in foreign countries is greater than at any time since war was declared.

All Heartily Approve Decision

And Commend the Policy of the Steel Corporation

Judges Unite in Decree, But Differ as to Intent of Organizers—Methods of Dealing With Competitors and Public Highly Commended by the Court

A COMPLETE victory for the Steel Corporation was recorded by the decision rendered in the dissolution suit which was filed at Trenton, N. J., Thursday, June 3, in the United States district court for New Jersey. The case was brought in October, 1911. Two years were occupied in taking the proofs, which covered 12,000 printed pages of witness testimony and 4,000 pages of exhibits. The case was argued at Philadelphia in October last. The argument, covering two weeks, was heard by the three circuit court judges of the third circuit court, Joseph Buffington, J. B. McPherson and Victor B. Woolley, and with them was associated Circuit Judge William H. Hunt, who, after the abolition of the court of commerce, was assigned by Chief Justice White, of the United States Supreme Court, to service in the third circuit. The main opinion, which was written by Judge Buffington, contains 85,000 words, while the concurring opinion by Judge Woolley, concurred in by Judge Hunt, contains about 9,000 words. These two opinions are printed in full on pages 1171 to 1218 of this issue.

The decision of the court is that the government is not entitled to a decree dissolving the Steel Corporation, but the jurisdiction of the bill is retained to enable the government to apply to the court in case there should hereafter be a repetition of "certain agreements to fix prices" which resulted from the Gary dinners and committee meetings, but which had already ceased before the suit was begun. The decision rests upon the construction of the statute settled by the Supreme Court in the Standard Oil and Tobacco cases and applied in the third circuit in the Powder case and the Keystone Watch case. This case, says the court, is largely one of business facts. The opinion shows that such unfair and unlawful acts as were found to exist in the first two cases mentioned were not found in the case of the Steel Corporation. Facts and figures are cited in detail to show the wonderful progress made by leading competitors of the Steel Corporation. The opinion takes up at length the testimony of the buyers and competitors and proves from their testimony that fair, genuine, unrestricted competition has existed for 10 years. Hence the court concludes that the question whether the Steel Corporation was monopolizing or obstructing home trade when the bill was filed is answered in the negative. The foreign trade is then discussed at length. A wonderfully interesting account of the development of this trade by the Steel Corporation is given. The court concludes that the Corporation has not monopolized or restrained the foreign trade.

The court shows that during the years preceding the formation of the Steel Corporation, iron was being supplanted by steel and that the processes of integration had been going on by which steel companies were extending their plants back to ore and forward to finished products. The court holds that this integration was far-sighted and necessary and brought about the formation of the Steel Corporation. The judge reviews at length the various acquisitions, including that of the Tennessee Coal, Iron & Railroad Co. and the Hill ore properties, and concludes that none of them was in violation of law.

The court then considers the Gary dinners and the committee meetings which followed. It expresses the belief that if the first dinner had not been followed by others and by the appointment of committees, "it was not likely that any steps would have been taken". As to the latter dinners and the committee meetings, the court says there was no positive and expressed obligation. No formal words of contract were used, but most of those who took part in the meetings went away knowing that prices had been named and feeling bound to maintain them until they had good reason to do otherwise, and until they had signified to their associates their intention to make a change. "We cannot doubt," says the judge, "that such an arrangement, or understanding, or moral obligation—whatever name may be the most appropriate—amounts to a combination, or a common action forbidden by law. The final test, we think, is the object and effect of the arrangement, and both the object and effect were to maintain prices at least to a considerable degree."

The court adds: "But the period of co-operation had passed away before the bill was filed and as far as we can see, it is not likely to be repeated. We do not think the Gary movement would justify us in imposing so drastic a penalty as the dissolution of the Corporation, but we will, if the government asks for such action, retain the bill for the purpose of restraining any similar movement by the defendants that might be contemplated hereafter. We may perhaps suggest that under recent legislation congress may have provided a sufficiently inclusive remedy for any future action that might have for its object the adoption or the maintenance of reasonable prices."

Judge Woolley filed an opinion, in which Judge Hunt concurred. This

Many Letters Received

The Iron Trade Review has received so many letters heartily commending the decision of the Steel Corporation suit that it is impossible to publish all of them in this issue. Among those to be published next week are letters from E. G. Grace, president, Bethlehem Steel Co.; Nicholas P. Lloyd, Newton Machine Tool Works, Inc.; F. A. Scott, secretary and treasurer, The Warner & Swasey Co.; Silas J. Llewellyn, president, Interstate Iron & Steel Co.; The Wellston Steel & Iron Co.; R. H. Sweetser, president, The Thomas Iron Co.; B. F. Bourne, president, The Bourne-Fuller Co.; F. B. Richards, M. A. Hanna & Co.; Justus H. Schwacke, Wm. Sellers & Co., Inc.; Alexis W. Thompson, president, Inland Steel Co.; C. G. Thomas, president, The Western Reserve Steel Co.; Col. J. G. Battelle, president, The Columbus Iron & Steel Co.; John A. Topping, chairman, Republic Iron & Steel Co.; C. M. Wambaugh, president, The Columbus Chain Co.; Edward E. Hughes, general manager Franklin Steel Works; A. F. Huston, president, Lukens Iron & Steel Co.; F. E. Nulsen, president, Missouri Malleable Iron Co. and W. H. Purcell, president, Alliance Machine Co.

opinion differs from that written by Judge Buffington as to various phases of the case, but concurs in the decree to be rendered. Inquiry as to whether the Steel Corporation is a monopoly and whether it combined with others to restrain trade within the meaning of the Sherman act is pursued by Judge Woolley along four lines:

First, Was the direct and necessary effect of the organization of the Steel Corporation to unduly restrain trade or create a monopoly? Distinguishing the power of the Corporation from the intent with which it was formed and its conduct subject to its organization, this branch of the opinion concludes that in its inherent nature, the Corporation is not a monopoly and that the direct and necessary effect of its organization is not unduly to restrain trade.

Second, Was an intent to monopolize or unduly to restrain trade shown by the circumstances which led up to and which surrounded the organization of the Corporation? The opinion holds that those who organized the Corporation intended to monopolize and unduly restrain trade by abolishing permanently what its constituent combinations had demonstrated could be abolished temporarily. The Corporation found, however, that it was without power alone to do what its organizers expected of it; that it lacked the power of monopoly and was immediately forced to resort to the old devices of pools in order to control the prices of its products.

Third, Was intent to monopolize or restrain trade shown by the after conduct of the Corporation? The opinion finds that the only conduct of the Corporation violative of the statute consisted in co-operating with its competitors by different means in different periods in fixing and maintaining prices. First, pool agreements were resorted to. These were discontinued in 1904. Then, from 1904 to 1907, meetings of the Corporation and its competitors were held and understandings were reached by which prices were controlled. These meetings were discontinued in 1907, when the Gary movement began. The first dinner was given in November, 1907, "to meet the unquestioned exigency arising out of the panic then existing and to devise ways and means to prevent calamity for the industry." "This," says Judge Woolley, "was not unlawful. But after the exigency had passed, Gary dinners were found to be potential things and they were afterward called and employed to exert their potentiality, not in averting disaster, but in creating greater profits by raising and maintaining prices in periods of industrial calm. The conclusion is drawn that in fixing, regulating and maintaining prices by the means pursued and upon the levels established at the Gary dinners and committee meetings, the Corporation and those of its competitors which co-operated with it restrained trade in a manner violative of the statute."

The opinion concludes with a statement that a decree of dissolution ought not to be awarded against the Corporation for the unlawful intent and the unsuccessful attempt of its organizers to violate the law, and that jurisdiction of the bill may be retained, if desired by the government, to restrain a repetition of the price-fixing practice viewed as illegal.

Judge Gary's Statements

New York, June 7.—Judge Gary has taken the very favorable news with his habitual calmness and composure, but it goes without saying that the chairman exhibits the keenest gratification over the action of the court. The first news of the decision to reach the Corporation headquarters here was a telephone message from Philadelphia to Judge Gary on Thursday afternoon within a few minutes after the decree had been filed. The news quickly was communicated throughout the official circles of the Steel Corporation and the brief, but momentous words that the suit had been won was greeted with the heartiest reception imaginable.

Judge Gary expressed his feelings in a short public statement. He said:

"I am very much gratified by information from Philadelphia that the Circuit Court of Appeals composed of Judges Buffington, McPherson, Woolley and Hunt, have unanimously decided the government case against the United States Steel Corporation in favor of the defendant. I feel this decision approves the general policy of the Steel Corporation. The decision should have a great and good effect upon business conditions throughout this country."

Appointed by Three Presidents

Of the four judges who heard and decided the Steel Corporation case in the United States district court, two, Judges McPherson and Hunt, were appointed by President Taft; one, Judge Buffington, by President Roosevelt, and one, Judge Woolley, by President Wilson. Judge Buffington was appointed judge of the western district of Pennsylvania in 1892, *by President Harrison. Judge McPherson was appointed to the bench of the eastern district of Pennsylvania in* 1899, *by President McKinley.*

White House Apathetic

Washington, June 8.—As a matter of course, an appeal will be noted by the government in the anti-trust suit against the United States Steel Corporation. This was acknowledged by Attorney General Gregory, on Friday, following a conference with Assistant Attorney Todd. Following the handing down of the decision in Trenton, N. J., Mr. Todd was supplied with a typewritten copy of the decision.

While there had never been any doubt in Washington as to the intent of the administration to take an appeal in the steel case, providing it went adversely as it did, the matter failed to receive as great attention as did the original filing of the suit. President Wilson was deeply concerned with the foreign situation and as yet he has not had time to confer with his cabinet regarding domestic matters. Mr. Gregory has been given a rather free hand in the matter to date.

By the end of the present month the supreme court will adjourn for the session. It will not convene again until next October. According to the present prospects, the department of justice will note an appeal in the Steel case before this adjournment.

Should the present administration fail to note an appeal in the case, it is recognized that President Wilson might loose a certain following in the Democratic party which has helped in working up public hostility toward the Steel Corporation in the past. For political reasons, therefore, it is believed, the present administration is compelled to carry the case on up. As a practical thing, however, it is felt that the White House is rather apathetic toward the case. A new feeling toward big business has been growinig in Washington during the past year. It culminated last winter in the creation of the federal trade commission, of which President Wilson is expecting so much in the way of regulating the affairs of important industrial corporations.

East Thoroughly Approves

New York, June 7.—Seldom has a judicial act evoked a more spontaneous outburst of approval and gratification among business men and among a large part of the general public than

(*Continued on page* 1154.)

THE OPEN HEARTH

The Great Victory for Square Dealing and Sound Business

THE decision of the United States district court in favor of the Steel Corporation is the greatest victory for square dealing in the history of business in this country, or any other country. Of course, the case will be carried to the supreme court, but as the decision rests solidly upon the decisions of the supreme court, the chance of a reversal is indeed remote. Brushing aside legal technicalities, Judge Buffington goes right to the heart of the case and dismisses once and for all the question of mere volume or bigness of business. "The question before us," he said, "is not how much business was done and how large the company that did it; the vital question is—how was the business, whether big or little, done?" In other words, the court holds that bigness and badness are not synonymous and that in order to conduct a business legally it is not necessary to be little.

The court's explanation of the purpose of the Sherman act is admirable. Judge Buffington points out that success and magnitude of business, the awards of fair and honorable endeavor, were not among the evils that threatened the public welfare and attracted the attention of congress when it passed the Sherman act, whose purpose was to foster and protect trade, both foreign and interstate. This being true, it certainly was not the intention to strike down the Corporation, organized and conducted with due regard for its competitors and the people.

The judge calls attention to the fact that when the constitution of the United States conferred on congress the right "to regulate commerce with foreign nations and among the several states", its purpose was not to fetter, but to further and foster trade.

That the fair treatment of competitors and their generous recognition of that treatment were highly important factors in bringing the minds of the judges to the decision which was reached is shown by the opinion written by Judge Buffington, and also by that written by Judge Woolley. Who would know best whether the Corporation had attempted a crushing policy? Let Judge Buffington answer the question. He says:

Testimony of Competitors

"NOW as trade is a contest for it between different persons and the gain of that trade by one means the loss of it to another, it follows that the person who best knows whether the man who gained it gained it fairly, is the man who lost it. If there is monopoly, if unfair business methods exist, if the course of trade and fair trading is throttled, we can find proof of it from business competitors. Trade competitors are the first to feel the pinch of unequal, unfair and undue restraint of the natural and normal course of trade. Being the first to suffer, they are the keenest to condemn. Turning, then, to this Steel Corporation's competitors, let us decide from the proofs whether the Steel Corporation had, when this bill was filed, a monopoly of the iron and steel business of the United States."

"Monopoly and unreasonable restraint of trade are, after all, not questions of law," adds Judge Buffington, "but questions of hard-headed, business rivalry, and whether there is monopoly of an industry, whether trade is subjected to unreasonable restraint, whether there is unfair competition are facts about which business competitors best know and are best qualified to speak. And it may be accepted as a fact that where no competitor complains, and much more so, where they unite in testifying, that the business conduct of the Steel Corporation has been fair, we can rest assured there has been neither monopoly nor restraint. Indeed, the significant fact should be noted that no such testimony of acts of oppression is found in this record as was given by the competitors of the Tobacco and Standard companies in the suits against those companies. We have carefully examined all the evidence given by the competitors of the Steel Corporation. We have read the testimony of the customers who purchased both from it and from its competitors. Its length precludes its recital here, but we may say its volume, the wide range of location from which such witnesses came and their evidently substantial character in their several communities, make inevitable the conclusion that the field of business enterprise in the steel business is as open to, and is being as fully filled by, the competitors of the Steel Corporation as it is by that company."

No Brutality, No Meanness

NOW, taking up the opinion written by Judge Woolley, in which Judge Hunt concurs, we find that the judge was not impressed by the integration theory. In very vigorous language, he denounces the early combinations whose "capital stock was issued for amounts vastly in excess of the properties purchased, thereby capitalizing the anticipated fruits of combination." He points out that the theory of integration was not dwelt upon by Mr. Schwab in his conversations with Mr. Morgan. He declares that the Gary dinners were in effect pools differing from pools only

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in the difference between the binding force of a moral understanding and the legal obligation of an expressed agreement. He declares that the organizers of the Corporation intended to create a monopoly and to restrain trade and acted with others to achieve it, and he says the fixing of prices should be prevented. In spite of these very positive views, however, Judge Woolley says that the conduct of the Corporation toward its competitors, as shown by the testimony, "has been conspicuously free from that business brutality, meanness and unfairness which characterized the conduct of certain large corporations found guilty of violating the anti-trust law." On account of its good record in this respect, and because it is not now attempting alone, or with other companies, to control the prices of iron and steel products, Judges Woolley and Hunt concur with the other judges in the decree to be entered.

A Bit of History

IN order fully to understand the significance of the decision just rendered, it is worth while to recall briefly the conditions connected with the filing of the dissolution suit. The filing of the case was a natural result of the long continued agitation, some of it well founded, against alleged improper methods of business enterprise, particularly big companies. There was, of course, some agitation of this kind 25 years ago, when the Sherman act was passed, but it reached its height about five years ago. The Roosevelt administration made an investigation of the Corporation under the direction of Commissioner Garfield, who acted in a spirit of fairness and believed that there was no justification for a suit against the Corporation. He had the hearty co-operation of the Corporation, as did numerous other government officials. The Garfield inquiry was followed by other investigations, such as those of the house and senate while the Payne tariff bill was pending, and that carried on by the so-called Stanley committee. The Steel Corporation expended a large amount of time, trouble and money in collecting vast volumes of information concerning its business for the benefit of the government. Never in the history of business had any company been so free in opening its books and telling its secrets. Its astonishing frankness was rewarded by the bringing of the dissolution suit under the Taft administration by Attorney General Wickersham, and the prosecution was continued under the present national administration. Both the Taft and Wilson administrations freely used against the Corporation the information which had been furnished government officials by the Corporation. The prosecution was ably conducted by General Dickinson and his assisitants, but the Corporation has won a complete victory.

Government and Business

AT the time of the filing of the suit in 1911, *The Iron Trade Review* said: "We are confident that in the end the Corporation will win a splendid victory and we are hopeful that some day this nation will have an administration with which it will be possible for the industries of the country to co-operate in solving the great problems which concern all the people." The end has all but come, so far as the courts are concerned, and the present and future administrations will at least be compelled to bow to the judicial mandates. To how much greater extent the warfare against business will be checked remains to be determined, but the decided change in sentiment that has taken place among the people, and the greater willingness of business men to conform to higher standards, furnish strong reason for the belief that there will be more co-operation of government agencies and the industries of the country in the future than ever before.

No License for Wrong Doing

LET no individual or concern imagine, however, that the decision permits unrestricted combination and control of prices. The court still has a grip on the case, so that it could promptly take action at any time if an unlawful attempt were to be made to control prices. This is not only a hint to the Corporation as to its future course, but also serves as notice to all business men and companies that unlawful combinations will not be tolerated.

All of the judges concur in declaring that the understandings resulting from the Gary dinners and committee meetings were illegal. Many men and companies, in the opinion of the judges, were guilty of illegal conduct, but the court is unable to see why one participant, the Steel Corporation, should be punished in a drastic manner and the others not at all. Says Judge Woolley: "The Corporation dominated only in the sense of contributing substantially to what was done and making attractive what it desired to be done, and the others yielded cheerfully. Their offense was no different from that of the Corporation, and the offense of the Corporation was distinguished from others only in the leadership it assumed in promulgating and effecting the policy."

In plain language, the words of the court mean that no license for wrong doing has been issued and that the little fellow has no more right than the big fellow to engage in any arrangement for controlling prices.

Prices Present and Past

Quotations on leading products June 9, average for May, 1915, average for March, 1915, and average for June, 1914. Prices are those ruling in the largest percentage of sales at the dates named.

	Prices June 9, 1915.	Average for May, 1915.	Average for March, 1915.	Aver. for June, 1914.
Bessemer pig iron Pittsburgh..	$14.60	$14.55	$14.55	$14.90
Basic pig iron, Pittsburgh.....	13.60	13.45	13.45	13.90
No. 2 Fdy. pig iron, Pittsburgh	13.45	13.45	13.45	13.90
Northern No. 2 Fdy., Chgo....	13.00	13.00	14.25	14.25
Lake Superior Charcoal, Chgo..	15.75	15.25	15.50	15.75
Malleable, Bessemer, Chgo.....	13.00	13.00	14.25	14.25
Southern No. 2, Birmingham...	9.50	9.75	9.50	10.45
Southern Ohio No. 2, Ironton.	12.50	12.50	12.75	13.50
Basic, eastern Pa.....	13.75	13.25	13.50	14.00
No. 2X Virginia furnace.....	12.50	12.50	12.50	12.50
No. 2X foundry, Philadelphia..	14.25	14.25	14.25	14.75
Ferro mang., Balt., (prompt)..	115.00	100.00	78.00	38.00
Billets, Pbgh.	20.00	19.50	19.50	19.75
Sheet bars, Pbgh.....	20.50	20.00	20.00	20.75
Steel bars, Chicago.....	1.39	1.39	1.38	1.28
Steel bars, Pittsburgh.....	1.20	1.20	1.15	1.115
Iron bars, Philadelphia.....	1.17	1.17	1.12	1.17
Iron bars, Cleveland, local del'y	1.20	1.20	1.15	1.20
Iron bars, Chgo. mill.....	1.15	1.15	1.17	1.10

	Prices June 9, 1915.	Average for May, 1915.	Average for March, 1915.	Aver. for June, 1914.
Beams, Chicago	$1.39	$1.34	$1.43	$1.28
Beams, Pittsburgh	1.20	1.20	1.15	1.115
Beams, Philadelphia	1.359	1.359	1.25	1.25
Tank plates, Pittsburgh.....	1.20	1.125	1.125	1.10
Tank plates, Chicago.....	1.34	1.29	1.38	1.28
Tank plates, Philadelphia.....	1.359	1.359	1.259	1.25
Sheets, blk., No. 28, Pittsburgh	1.80	1.80	1.80	1.82
Sheets, blue an., No. 10, Pbgh.	1.35	1.35	1.30	1.35
Sheets, galv., Nov. 28, Pbgh...	4.25	3.40	3.40	2.77
Wire nails, Pittsburgh.....	1.55	1.55	1.60	1.50
Connellsville fur. coke contr...	1.65	1.65	1.65	1.85
Connellsville fdy. coke, contr...	2.25	2.25	2.25	2.35
Heavy melting steel, Pbgh....	11.75	11.75	12.00	12.00
Heavy melting steel, east'n Pa.	11.00	11.25	11.00	10.75
Heavy melting steel, Chgo.....	9.25	9.25	9.89	9.75
No. 1 wrought eastern Pa.....	12.50	12.50	12.50	12.50
No. 1 wrought, Chgo.....	8.75	8.75	9.00	8.88
Rerolling rails, Chgo.....	10.00	10.00	11.25	11.25
Car wheels, Chgo.....	9.75	9.75	11.75	11.25

(For Additional Prices See Page 1228.)

Large Basic Pig Sales at Advances

Higher Prices Established by Transactions Involving Good Tonnages—

Foundry Iron Market Not Active

Philadelphia, June 7.—Advances a week ago in the eastern Pennsylvania market for basic iron have been thoroughly established by further purchases of larger blocks of metal during the past few days. The Lukens Iron & Steel Co., which in April purchased approximately 50,000 tons of this grade for delivery by October at $13.15 to $13.25, delivered, has again entered the market and has closed, it is estimated, for 30,000 to 35,000 tons additional from several makers at $13.50 to $13.75, delivered. Some of the facts regarding these transactions are not yet clear, but it is understood most of the iron is for fourth quarter delivery and that $13.75, delivered, was paid for at least a portion of the order for that period of shipment. A smaller amount of iron was taken for earlier delivery. It is believed these sales place the forward basic market at or around $13.75, delivered, and this is the figure most makers now are asking, though at least one interest is holding out for $14, delivered. Melt of basic among eastern Pennsylvania users is good, due to steel mill activity and stocks with some consumers are low, to which some delays in shipments by the furnaces have contributed. On the other hand, one steelmaker has continued to pile iron and now has 90,000 tons on furnace banks. This represents an accumulation, however, of an extended period. Inquiry among consumers of low phosphorus iron has turned to more forward deliveries and one maker has advanced standard iron 50 cents to $1 a ton to $20.50 to $21, Philadelphia. Some sales have been made on this basis, including one lot of 1,000 tons. Lebanon makers have been shipping this grade heavily, in one case at about 150 per cent greater than during the monthly average for the last half of 1914. War orders have helped to stimulate the demand for this grade.

Foundry iron has not shown the same degree of betterment as steelmaking grades; in fact, is practically unchanged at $14.25 to $14.50, Philadelphia, for No. 2X, though some makers now are holding for $14, furnace, or about $14.70 to $14.80, Philadelphia. Virginia iron is unchanged at $12.50 to $13, furnace, for No. 2X. Foundry iron buying continues moderate. A Trenton, N. J., sanitary ware manufacturer asks 1,000 tons of Nos. 2X and 2 plain for eight to 10 weeks' shipment. A Phillipsburg, N. J., pipemaker bought 1,000 tons of low grade iron and is still negotiating. A Philadelphia shop took 200 tons of mallea-ble at slightly over $15, delivered. The Lenoir City, Tenn., Car Works asks a small tonnage. One Brooke furnace is going in this week.

Iron For Investments.

New York, June 8.—Further negotiations for pig iron for investment by New York capitalists has represented the only active side to the market in this territory during the past week. Additional sales of this character just closed by New York iron houses, total 10,000 to 15,000 tons, practically all of which entails southern metal. Some larger propositions are under way at the present time for both northern and southern iron and one of these involves about 50,000 tons. Buffalo makers have been figuring upon some of these matters. In the consumptive trade, sales have been rather few and scattered. A Cartaret, N. J. shop bought 1,000 tons of eastern Pennsylvania No. 2X for last half; a Waterbury, Conn. buyer, 1,000 tons of foundry additional and the inquiry of a Poughkeepsie buyer, involving 1,500 to 2,000 tons of foundry and charcoal grades now has been closed. Considerable Alabama iron continues to go in to New England centers, particularly at water points. Prices in this territory re-

(*For complete prices see page* 1228.)

main on the same basis or $14.25 to $14.50, tidewater, for No. 2X. Not many export iron transactions now are being made. The Italian State Railways was the purchaser of 2,000 tons of 2 to 2.50, silicon iron for delivery at Norfolk. The business went to a central Pennsylvania furnace. Southern makers quoted $12.75, Norfolk, on this business.

Iron Shipments Gaining

Buffalo, June 8. — Furnaces of the Buffalo distirct report that the disposition on the part of foundries to anticipate on the shipments of iron under contract is more pronounced than it was a week ago. There are a number of cases where users have ordered out iron for immediate shipment that was not due before September and at least one foundry of the district has already specified for all of the iron that it ordered to cover its contract requirements for the remainder of the year.

Westinghouse Wants Foundry

Pittsburgh, June 8.—Westinghouse interests have quietly opened negotiations for 15,000 tons of miscellaneous foundry grades for shipment the last half of this year to plants in this district. No. 2 foundry is selling at a range from $12.50 to $13, valley. Numerous small lots are being sold, but no large orders have been booked recently. It develops that about 25,000 tons of basic was obtained a week or 10 days ago by a Pittsburgh interest for speculative purposes. Standard basic is being held at $12.65, valley. Dealers are quoting bessemer at $13.75, valley, but not much activity has been enjoyed. Blast furnace managers express confidence that demand for pig iron will increase during the third quarter and predictions of advances in prices are made. The Carnegie Steel Co. is blowing 44 of its 59 blast furnaces, compared with 23 for the low point reached last December.

Southern Iron Weak

Cincinnati, June 7.—The southern pig iron market has slipped back a little, as two furnaces are occasionally offering No. 2 foundry iron on desirable business at $9.50, Birmingham basis, for the third quarter. All other furnaces in Alabama and Tennessee are holding at from $9.75 to $10, Birmingham basis, for the last half. The market is quiet, the only inquiry before sellers being one for from 1,500 to 3,000 tons of northern and southern foundry grades for the last four months of the year, which comes from a melter in Evansville, Ind. Shipments on old contracts continue good, and taking the average of all stacks throughout the south and southern Ohio, it is probable that furnace stocks are being slightly reduced. Southern Ohio No. 2 foundry is stationary at from $12.50 to $12.75, Ironton basis, for the last half. Occasional sales of high silicon iron are being made at from $14.75 to $15, furnace, for 8 per cent silicon, with the higher price prevailing.

Activity is Less

Chicago, June 8.—A decided lull in inquiry and contracting for pig iron has followed a period of considerable buying. Inquiries now on hand do not total as high as has been the rule for several weeks and practically all are for lots of 500 tons or less. Sales for May showed a gratifying increase over April and have proved the best month of this year. Additions have been made to active blast furnace capacity and stocks at furnaces have been reduced considerably. The situation presents a nnumber of elements of strength and sentiment is decidedly better than has obtained for a number of months.

Prices on northern iron remain firm and $13, Chicago furnace, is the ruling figure for No. 2 foundry and malleable. Southern iron apparently has weakened somewhat and quotations of $9.75, Birmingham, are being made, with indications that some sellers are willing to take limited tonnages at $9.50, Birmingham, although the latter price is not a decided factor in view of the lessened demand now presented. Some transactions for immediate delivery at $9.50, Birmingham, are believed to have been made.

Gaining Strength

Birmingham, Ala., June 7.—Pig iron sales for May were larger than the make of furnaces now operating in the Birmingham district, and while prices remain unchanged, there is a general understanding that the market is gaining in strength daily. No. 2 foundry is quoted at $10 for delivery during the last half of the year and at $9.75 for immediate delivery.

Pipe Purchased

Pittsburgh, June 8.—An independent gas interest has placed orders for 15 miles of 8-inch steel pipe for shipment to Ohio points. No other orders of importance are reported. Advanced quotations for galvanized pipe, adopted June 1, are asked by all makers of steel and iron tubular goods, but some mills are unable to offer galvanized material on account of the spelter situation. Demand for locomotive boiler tubes is more active, but merchant tubes show no snap.

(*For complete prices see page* 1228.)

Wire Demand

From Foreign Countries Very Heavy—Some Orders Refused

Pittsburgh, June 8.—Demand for wire products, including nails, plain wire, barbed wire and wire rods, is decidedly heavy. Foreign interests are cabling for large tonnages for shipment to all parts of the world and the domestic trade is figuring more prominently in the market. Inquiries from jobbers in the west and northwest involve rather heavy tonnages. Several mills are refusing to book additional orders, being unable to promise immediate shipment. The advanced extras for galvanizing material are being maintained by all manufacturers in the Greater Pittsburgh district. Nails are selling at $1.55 a keg.

Sheets in Store Limited

Cleveland, June 8.—The volume of warehouse business continues to be satisfactory. Difficulty is being experienced in meeting the demands of consumers of galvanized sheets, as the supply in store is limited. Prices range from 4.60c to 5c.

Dole Out Galvanized Sheets

Chicago, June 8.—Sales of galvanized sheets from store in Chicago are being made only after due consideration of the needs of the buyer. Only those who can show their actual necessity are able to obtain galvanized sheets, and then only in absolutely necessary quantities. Prices, which rose from 4.00c to 4.20c and then to 4.60c last week, have been advanced to 4.85c today and the belief is held that even higher figures will be seen before many days have passed.

Warehouses have only a limited tonnage and for the most part their contracts do not extend beyond July 1. Where further stocks of sheets may be obtained is a matter troubling warehousemen not a little. Warehouse business remains brisk except for the lack of demand for building materials in Chicago, resulting from the strike of the building trades.

May Advance

New York, June 7.—There is some talk of an advance July 1 in the warehouse prices on plates, shapes and bars, in metropolitan territory. These prices have remained unchanged for months at 1.80c, for New York delivery on steel bars and at 1.85c, for plates and shapes. Warehouse business in this district has been improving gradually and now is quite good.

Bars to Make Shrapnel

Are in Active Demand—Mills Stand Pat on Six Month Contracts for Agriculturalists

New York, June 8.—An inquiry for 3,000,000 shrapnel for Italy has been placed before manufacturers in this country during the past week by New York agents. This order, it is estimated would require from 35,000 to 40,000 tons of steel rounds if the shells are machined. It generally is expected in the steel trade that Italy now will be a large buyer of ammunition in this country. Large bar tonnages for ammunition and other purposes continue to be called for in various inquiries being placed before makers in this city, but no additional orders have been learned. In other lines, the bar market is showing fair activity and specifications are keeping up. A considerable tonnage of reinforcing bars will be required for the new East river piers of the city in Brooklyn. Steel bar prices are maintained at 1.20c, Pittsburgh, and 1.369c, New York, for second quarter.

War Orders Predominate

Pittsburgh, June 8.—Steel bar manufacturers in this and adjacent territory continue to book heavy tonnages for the manufacture of miscellaneous types of war material. Conflicting reports concerning war orders and the tonnages of steel involved are heard. Mills furnishing material for munitions hesitate about announcing details of orders to the public. Steel bars are firm at 1.20c for prompt delivery and 1.25c is being quoted for shipment after July 1. Iron bars are being held at a minimum of 1.25c by leading makers in this district.

Some Concessions on Contracts

Philadelphia, June 7.—Some last half contracts in steel bars, it is learned, have been put through recently with larger buyers on the basis of 1.25c, Pittsburgh. These necessarily have not been confined to eastern Pennsylvania and surrounding territory; in fact, it is not understood that any important contracts have been closed here at this basis. Such contracts are confined to certain sellers, as others are watching their obligations very carefully and except to the farming implement trade, are not seeking business beyond the third quarter. Where they do quote for last quarter, they ask a further advance of $1 a ton over third quarter, or 1.30c, Pittsburgh. Specifications in this territory are satisfactory to makers. In new business, an unusual inquiry for 1,000 tons of flats came from a mill which is a maker of such product. The Norfolk & Western railroad contracted for 200 to 300 tons for last half. The Carnegie Steel Co. took 230 tons from the government for Panama delivery. A new inquiry for 160 tons of punched pile straps or flats has been issued by the government. About 300 tons of bars for export were placed with a middle western maker this week, including some tonnage for Greece. Early bars are well held at 1.20c, Pittsburgh, or 1.359c, Philadelphia, and recent shading does not appear to have been serious.

Deadlock on Bars

Chicago, June 7.—Steel makers and agricultural implement makers apparently have argued the question of future contracts to a deadlock. No serious difference exists as to price, the quotation of 1.39c, Chicago mill, for bars to Jan. 1 being assented to by this class of consumers. Insistence by mills that contracts be limited to last half is not so readily accepted by implement makers, who are holding out for a contract covering 12 months from July 1. However, general improvement in business conditions has caused buyers to expect somewhat better outlet for their product and they are becoming more anxious to settle the matter and cover their requirements. Mills apparently are standing as a unit on the short term contract and so far no weakness has developed in this position.

Specifications against existing contracts for steel bars are being received in gratifying volume and contracts for bars for third and fourth quarter are being made regularly. The prevailing quotation is 1.44c, Chicago mill, except to agricultural implement builders, as previously stated.

Mills are Firm

Cleveland, June 8.—Inquiries for bars for the manufacture of shrapnel and other war materials continue to be received, but are not being regarded with much favor by Cleveland manufacturers. On one inquiry for 5,000 tons, which came from Pittsburgh, a prominent company declined to quote. Steel bar manufacturers are adhering firmly to the quotation of 1.20c, Pittsburgh, for contracts with agricultural implement manufacturers for the six months beginning July 1, and some additional contracts have been made. Investigation of two or three cases in which one company made a contract for the year at 1.20c, Pittsburgh, has established the fact that this action was taken inadvertently and is not in harmony with the general policy of the company.

Iron Bars Steady

Chicago, June 8.—Conditions in the bar iron market are unchanged, comparatively small buying being the rule, probably resulting from inventory being taken by most consumers, but prices are unchanged. Mills are still holding 1.20c, Chicago mill, and have no difficulty in obtaining this figure on such tonnages as are offered. Operations continue at a low scale, probably not exceeding 50 per cent, and indications for added business during the present month are not bright.

Mild Improvement

Philadelphia, June 7.—Continued mild betterment in the demand for bar iron upon eastern Pennsylvania mills is to be noted, though it is scarcely sufficient to cause much change in operations. Prices are more uniformly around 1.15c, mill, minimum, with some makers asking more. There is a good demand for special low phosphorus bars and makers now are negotiating for orders which, if secured, will fill them completely to the end of the year.

Hoops, Bands, Shafting.

Pittsburgh, June 8.—The market for cold rolled steel shafting reflects strength. Several prominent makers are asking 68 per cent off for third quarter and 67 per cent off for fourth quarter delivery, and it is believed that quotations below those levels soon will disappear entirely. Shafting makers are operating plants at practically maximum capacity for the first time in many months. Hoops are being held at 1.30c by some interests, but material continues to be sold at $1 a ton under that figure when attractive tonnages and specifications are involved. Steel bands are listed at 1.20c.

Production of Shapes, Rods and Nails

A special bulletin issued by the American Iron and Steel Institute shows that the production of structural shapes for 1914 was 2,031,124 tons, compared with 3,004,972 tons in 1913. Production of wire rods in 1914 amounted to 2,431,714 tons, compared with 2,464,807 tons in 1913. The production of nails in 1914 was 13,902,479 kegs, compared with 14,401,765 kegs in 1913. In 1914, 13,132,814 kegs were wire nails and the remainder cut nails.

(*For complete prices see page* 1228.)

More Vessel Contracting

Numerous Propositions Pending With Atlantic Coast Yards—Plate Prices Are Firmer

New York, June 8.—Some of the largest shipbuilding propositions which yet have been before Atlantic yards now are being negotiated in this city and the prospects are reported to be favorable for their consummation. One or two of these projects inolve the construction of fleets of about ten vessels each. One of these is for a West Indian transportation interest. A large number of other vessels continue in the market, including additional tank ships for the Standard Oil Co. One estimate in shipbuilding circles places the amount of pending work at approximately $20,000,000. Foreign countries continue among the inquirers for boats, Spain having been one of the latest to solicit prices. The Maryland Steel Co., which received an additional boat from the Munson line the past week, may have this increased by another vessel. These immediate and prospective marine requirements are the principal features of the plate market in this district. Several thousand tons of plates will be required for a Brooklyn subway section to be bid upon June 15. On new business, 1.20c, Pittsburgh, or 1.369c, New York, is quoted for second quarter, but specifications at present are largely against contracts on a lower basis.

Vessel Contracting Continues

Philadelphia, June 7.—New business in marine construction along the Atlantic coast keeps up strongly and the market remains filled with new boat propositions, some of them of large size. In fact, it is stated there are fully as many vessels now before builders as those placed, which since December now number 36. The latest addition within a week was another steamship for the Munson Line, placed with the Maryland Steel Co. This builder now has taken eight boats in the present movement, including two for the Munson Line, and has its capacity filled for more than a year ahead. The Cambria Steel Co. is expected to furnish the 2,000 to 3,000 tons of plates for the latest Munson boat. Plate tonnage with eastern mills has undergone no appreciable change the past week and is of such size as to justify 75 to 85 per cent operations. Buyers have been inquiring the past week more freely for forward contracts and in some instances have sought to be covered for the fourth quarter, on which they have been quoted by certain eastern mills 1.30c, Pittsburgh, or $1 a ton over the third quarter and $2 over the present quarter schedule. Some large buyers have accepted quotations for third quarter, which are $1 above their contracts expiring July 1. Plate prices generally appear to be firm. The Norfolk & Western railroad has contracted for 1,000 tons for last half.

Show Signs of Strength

Pittsburgh, June 8.—With the opening of the second half only a few weeks distant, plate manufacturers plan to advance quotations to the basis of 1.25c for third quarter, and it is not improbable that several mills will withdraw prices below that figure within the next fortnight. Leading mills have experienced some difficulty in obtaining 1.20c for plates, but the market has been improving considerably the last few weeks. The placing of contracts for steel cars by domestic and foreign interests has benefited the market for steel plates, shapes and bars. Finishing mills, generally speaking, are operating plants as from 75 to 80 per cent of capacity.

Plates Somewhat Stronger

Chicago, June 8.—Some increase in strength of steel plates is manifesting itself in the west. Greater activity among car builders as the result of recent contracts has brought a large tonnage into the market and general demand also has had its effect. While it was possible to obtain plates at 1.29c, Chicago mill, within the past two weeks, it appears that at present 1.34c, Chicago mill, is the best that can be done unless some unusual circumstance is involved in the transaction.

Sheets for the Argentine

Booked at Fair Price—High Quotations on Spelter Continue to Demoralize Galvanized Sheet Market

Philadelphia, June 7.—Eastern Pennsylvania sheet mills continue to operate at practically full capacity, as specifications are liberal. New buying, while not large, is considerable. Prices incline toward greater firmness and 1.30c to 1.35c, Pittsburgh, or 1.459c to 1.509c, Philadelphia, is the current range. Many of the contracts now being specified against are on the lower basis.

Spelter Influences Prices

Pittsburgh, June 8.—With spelter continuing to command unprecedented high prices, galvanizers rapidly are withdrawing from the market. Small tonnages of galvanized sheets are being offered for immediate acceptance on the basis of 4.25c for No. 28 gage, but only a few mills are in a position to fulfill contracts. As has been the case since spelter advanced to abnormally high levels, many mills are urging consumers to accept substitutes for galvanized sheets. This has caused irregularity in the market for black sheets. While leading makers are quoting 1.80c and above for No. 28 gage, yet that figure is being shaded rather frequently in adjacent territory. The American Sheet & Tin Plate Co. has booked an order for 2,240 tons of black sheets for shipment to Argentina at a price understood to be above the domestic market.

Tin Plate Mills Busy

Pittsburgh, June 8.—Tin plate manufacturers in western Pennsylvania and eastern Ohio are enjoying active conditions. Rather low prices are being offered, however, for immediate shipment, but $3.10 appears to be the bottom of the market. No large orders for domestic or foreign shipment have been booked this week.

Black Sheets Irregular

Cleveland, June 8.—Increased production of black sheets by mills which have ceased making the galvanized product has caused weakness in the black sheet market and prices are irregular, as are also quotations on blue annealed. It is believed that many buyers of galvanized roofing will use slate and other roofing material not metallic on account of the very high price of the galvanized product.

Sharp Advance

Cincinnati, June 8.—The galvanized sheet market has advanced sharply in sympathy with the advance in spelter, and No. 28 gage is now quoted at 5c, Pittsburgh basis, for prompt shipment. Another advance is expected before the end of the week, and rolling mills state that 6c, Pitts-

(*For complete prices see page* 1228.)

burgh basis, will be the ruling quotation by June 15. Mills are refusing to quote for contract shipment on this grade. Black sheets are unchanged and are quoted at from 1.80c to 1.85c, Pittsburgh basis. Sales are only fair, but specifications on old contracts are heavy, especially for galvanized sheets.

Galvanizers Have Quit

Chicago, June 8.—Sheet makers are entirely out of business as far as galvanized products are concerned. Spelter is at a level which precludes the possibility of making and selling galvanized sheets at a profit or even at cost. Spelter has gone so high that sheets cannot be sold even at cost, for consumers cannot use them at that price and dispose of their product. Warehouses and brokers having contracts continue to fill the entire demand, but even from this source the demand is small.

Black sheets continue in comparatively small demand and quotations are unchanged.

Billet Makers

In the East See Signs of Tightening at Pittsburgh

Philadelphia, June 7.—A disposition on the part of some mills to watch their forward supply of semi-finished steel more carefully is illustrated by the policy adopted by one large middle western maker not to make quotations on billets or sheet bars beyond the third quarter. Advances are asked on any third quarter steel. A leading Pittsburg maker is understood to remain out of the market entirely. Eastern Pennsylvania billet makers continue to see evidence of this tighter condition of crude steel in the Pittsburgh and surrounding districts through the receipt of further inquiry from buyers in that territory. Eastern billet sellers are doing better in new business in a moderate way. The Alan Wood Iron & Steel Co. now is operating six out of nine furnaces. Eastern billet prices remain at around $19.50, Pittsburgh basis.

Semi-Finished Stiffen

Pitsburgh, June 8. — Youngstown manufacturers have advanced quotations for billets and sheet bars about 50 cents a ton, but prevailing minimum prices have not disappeared for prompt delivery. Specifications from sheet makers, many of whom are unable to manufacture galvanized products on account of the spelter situation, have fallen off to a considerable extent, but sellers are not attempting to offer accumulations in the open market. Forging billets are commanding rather fancy prices, some sellers refusing to shade $26, Pittsburgh. Demand for wire rods for domestic and foreign shipment is decidedly heavy and several makers are refusing to accept additional tonnages for anything like prompt delivery. Inquiries for wire rods are coming out from all quarters of the globe and a number of attractive orders for far eastern shipment have been placed. Muck bar nominally is quoted at $27, Pittsburgh.

Spot Ferro

Has Been Advanced to $115—Shipments Being Made Slowly

New York, June 8. — Spot ferromanganese now has reached $115 a ton at the plant of the maker, a fair sale of domestic product having been made in eastern Pennsylvania at that figure within the week. Domestic makers who have had some spot material to offer, generally are inclined to ask more than $100 a ton at the plant since the recent advance to that level of the English product for indefinite delivery was established. Little immediate tonnage from domestic makers probably now could be obtained, even at $100, at the maker's plant. Some of the home producers are reluctant to sell at all at present, as they are expecting higher prices in the spot market.

Difficulty in getting freight room is causing some delay in further shipments of English metal to this country, especially that for which new licenses were granted by the British Admiralty during May. Arrivals during the past week have totaled about 3,000 tons additional, including the Rownmore at Baltimore with about 1,200 tons, the Dominion at Philadelphia with about 700 tons, the Manchester Mariner with about 800 tons, while the Sylvania is arriving at New Orleans with about 800 tons.

English makers are selling new lots sparingly and it still is required that each transaction be submitted to them for final acceptance. There is continued report that the official English price of $100, seaboard, is not being strictly maintained.

Ferro Dealers Ask $100

Pittsburgh, June 8.—Sellers of ferromanganese in western Pennsylvania are asking $100 a ton at the eastern seaboard for this material, although reports of tonnages being offered at slightly less than that figure are heard. Dealers express the opinion that ferromanganese will continue to command rather fancy prices throughout the remainder of the year, because of increased consumption without any increase in imports. Several sellers of low grades of ferro-silicon have advanced quotations to the basis of $16.50 for No. 10 grade, but the $16 figure has not disappeared. Demand for alloys for the manufacture of special steel is comparatively heavy and some buyers have experienced difficulty in covering requirements. No change in the position of prices for ferro-molybdenum, ferro-chrome and ferro-tungsten is noted.

By Five Cents

Price of Mesabi Ores Are Reduced Owing to Lower Freight Rates

Owing to the reduction of 5 cents in the ore carrying charge from Mesabi mines to upper lake docks, Mesabi nonbessemer ore is being sold at $2.80 and Mesabi bessemer at $3.45, a reduction of 5 cents. In the case of some sellers, however, the full price is inserted in the contract, with the statement that buyers will be credited with 5 cents per ton on account of the change in freight rates.

Out of a total of 5,012,359 gross tons of ore shipped during May, 3,629,570 tons went to Lake Erie ports, distributed as follows:

Port.	May, 1915.
Buffalo	366,123
Erie	23,797
Conneaut	1,147,972
Ashtabula	614,981
Fairport	249,965
Cleveland	588,168
Lorain	411,736
Huron	71,233
Sandusky	.....
Toledo	66,752
Detroit	88,843
Total	3,629,570

Cuban Ore Moves Freely.

Philadelphia, June 8.—An eastern Pennsylvania steel company now manufacturing ferro-manganese, has purchased an additional block of Brazilian manganese ore within the past several weeks. Brazilian manganese ore is now quoted at about 35 to 40 cents per unit of manganese at eastern seaboard or about 15 cents per unit higher than before the war. Eastern Pennsylvania consumers also have just made some trial purchases of Cuban manganese ore. Shipments of Cuban iron ore to the Pennsylvania, Maryland and Bethlehem Steel companies are coming forward in about the same volume as for several months past. A recent effort of the British Admiralty to commandeer one vessel of the Spanish-American Iron Co. supplying the Maryland and Pennsylvania Steel companies, did not entail any serious inconvenience to the

(*For complete prices see page* 1228.)

shippers, as the vessel was released subsequently through diplomatic procedure. This company is now receiving a supply of ore fully up to its current requirements. Should its needs increase, however, the general scarcity of boats and the prohibitive freights may prevent any increase in the movement which might necessitate this consumer entering the market as an ore buyer. The Cuban shipments of the Juragua Iron Co., the subsidiary of the Bethlehem Steel Co., have not been interfered with.

Scrap Market

Shows Little Life—Prices at Most Centers Are Irregular

Philadelphia, June 7.—A better demand for certain grades of scrap has made the market generally in this territory slightly more active, but the tonnage materials, such as heavy melting steel, have shown no change. New offers of $10.75, delivered, for wrought pipe have been put out by buyers and some business has been done. A Harrisburg buyer closed for 1,000 tons or more of stove plate at $9.50, delivered, though another user dropped his offers to $8.50, delivered. Low phosphorus is in active demand and scarce. Offerings of heavy cast is liberal and middlemen have had opportunities to buy at $10.50, Philadelphia. Heavy melting steel continues around $11, delivered. The government has postponed for a month, or until July 7, the taking of bids, originally scheduled for today, on 27,000 tons of Panama iron and steel scrap. This was done to enable prospective bidders the opportunity to visit the isthmus and inspect the material.

Demand Light

New York, June 8.—Demand for old material in this market continues surprisingly light, in view of the better operations of the larger consumers. Heavy melting steel is slow and dealers have dropped the price which they have been offering to $8.50 and $8.75, New York. Pittsburgh does not seem much interested in eastern steel. The call for wrought pipe from the rolling mills is active and these buyers appear to be taking it in because of its cheapness over yard or railroad wrought. The usual price is $10.75, delivered eastern Pennsylvania. Higher is reported in some cases. There is buying of stove plate by Jersey buyers at unchanged prices.

Demand For Carwheels.

Buffalo, June 8.—The inquiry for old carwheels continues good. There are several inquiries for good sized tonnages, but the supply is far behind the present demand. One dealer reports an offer of $12, Buffalo, for several hundred tons, but tonnages are scarce. This situation has caused the price to advance from $11.00 to $11.50 to $11.50 to $12.00. Shipments of heavy melting steel are going forward in good volume at the previously quoted price of $10.75 to $11.00. Borings and turnings are moving freely, but no advance in prices. Demand for wrought scrap is light.

Scrap Marking Time.

Pittsburgh, June 8.—The market for old material shows no snap and it generally is believed that it will mark time until consumers open negotiations for future requirements. Heavy melting steel is being held at $11.75, although considerably below that figure was paid for material recently disposed of by the Pennsylvania railroad. Low phosphorous scrap has been in good demand and rather fancy prices are prevailing for this grade.

Buying is Light

Cleveland, June 9.—While sentiment is good in the iron and steel scrap market, prices are weak, due to an overabundance of scrap. Material is extremely "loose" at present. Machine shop turnings and cast borings are especially weak, large quantities of these descriptions having been turned out by machinery manufacturers whose activity has been increased of late. Mill buying continues light in the Cleveland district, while in the valleys most of the mills are covered through July. Heavy steel continues quotable $10.25 to $10.75, Cleveland, and $11.25 to $11.50, Youngstown.

Sales Low

Cincinnati, June 8.—The scrap market is quiet and devoid of features. Dealers state that it does not pay them to handle certain grades of old materials, as they are unable to dispose of them at a reasonable profit. New contracts have dropped off to a minimum. Shipments on old contracts to rolling mills are the only good features in the market, as these consumers are taking good quantities of bundled sheet scrap, No. 1 bushelling and heavy melting steel. Rolling mills in this territory are running full in all departments in order to lay in a good stock of sheets before the hot weather sets in. Prices are unchanged on all grades of scrap, and they are expected to remain stationary for several weeks.

Scrap Market Quiet

Chicago, June 8.—Dealings of scrap iron and steel in the Chicago market are at a minimum. Mill consumers are not in the market and are taking only bargains offered by brokers who fell compelled to part with some of their accumulations at the low price offered. One large consumer has kept its reserve stock full without entering the market for several weeks past and its average cost will range well below the general market. Railroads continue to offer large tonnages and at present over 15,000 tons are actively before the trade. This continued dumping of railroad scrap has a tendency to weaken and depress the market further, but so far it has been observed without making a material change in quotations.

The Wabash Railway offers 1,500 tons, including 100 tons of No. 1 rails; the Chicago & Alton 550 tons, Santa Fe 3,000 tons, Soo Line 900 tons, all steel car wheels; Southern Railway 6,400 tons, Monon 1,300 tons, Belt Railway of Chicago 300 tons, C., M. & St. P. 1,400 tons, including 500 tons of No. 1 rails, Toledo, St. Louis & Western 700 tons and the Kansas City Southern 325 tons.

Soft at St. Louis

St. Louis, June 8.—The scrap market has been soft and weak, and no transactions have been reported of importance for the last 10 days, as consumers of rolling mill grades and also melting steel are still out of the market.

However, during the last two or three days, the feeling has improved somewhat and may lead to a small advance in several commodities. Relaying rails are in good demand, and prices are firm at $21.50 to $23 per gross ton, according to the condition of the rails.

Railroad lists before the market are: Chicago, Indianapolis & Louisville, 1,100 tons; Kansas City Southern, 350 tons; Wabash, 1,300 tons; Chicago & Alton, 550 tons; Mobile & Ohio, 1,700 tons, of which 540 tons are for No. 1 railroad wrought. The Mobile & Ohio also offers an additional 17 cars of cast iron wheels.

The Steel City Engineering Co., House building, Pittsburgh, has been organized to engage in consulting, designing and testing engineering. Associated with the firm are F. J. Denk, L. J. Schaedle and C. A. Schaedle, who have had broad experience in their respective lines of engineering science. Their field will cover power plants and accessories, steel works and blast furnace engineering, and general engineering in addition to piping layouts, general designing and general testing work on boilers and engines.

(*For complete prices see page* 1228.)

Coke Inquiry

Comes From Four Blast Furnace Companies—Output Increasing

Pittsburgh, June 8. — At least four blast furnace interests have entered the market for second half requirements and pending inquiries involve approximately about 50,000 tons of blast furnace fuel a month. Indefinite negotiations have been opened for coke for several blast furnace stacks now idle. It develops that a rather small tonnage of 48-hour coke was sold a few days ago on a sliding scale basis, with a $1.75, ovens, named as the minimum price. Several operators are refusing to sell at that figure for six months' delivery, but some grades continue to be offered at $1.65, ovens. Demand for foundry coke continues active, but no change in price position is noted. Talk of a labor scarcity in the Connellsville regions is heard, but operators do not expect to be embarrassed until demand for fuel increases substantially. The *Connellsville Courier*, for the week ending May 29, says the production in the upper and lower regions was 316,890 tons, compared with 306,691 tons the week before, an increase of 10,199 tons. Weekly production records for the year were broken the week ending May 29.

Buys Virginia Coke

Philadelphia, June 8. — A Virginia blast furnace has purchased 2,500 tons of 48-hour coke from a Virginia maker for June shipment. The Norfolk & Western railroad has closed for its last half requirements of foundry coke estimated at from 1,500 to 2,000 tons monthly and the business went to Virginia ovens. The Seaboard Air line is in the market for 2,000 tons of 72-hour and 2,000 tons of 48-hour coke for last half delivery.

Smelter Purchase

New York, June 8.—A recent inquiry for 4,000 tons of smelter coke for shipment to the plant of an American metal company in Chile, has been satisfied from a Connellsville producer.

Coke Active

Cincinnati, June 8.—The coke market continues active on 72-hour grades, and the majority of foundries are closing for next year's requirements. Prices remain steady and firm despite rumors of lower quotations in all three southern fields, as operators are keeping only a sufficient number of ovens in blast to supply contracts, and can sell their coal at a profit as large as they can realize on coke. Furnace coke is quiet, the only sale recently being 2,500 tons to a stack in this territory for immediate delivery.

Sale of Foundry Coke

St. Louis, June 7.—One sale of from 4,000 to 5,000 tons of foundry coke is reported from last week, which is the most interesting transaction in the coke market that has taken place for some time. Connellsville and Virginia foundry grades are held at $2.40, ovens.

Cast Pipe

Is in Better Demand Among Eastern Makers

New York, June 8.—New tonnage with eastern cast iron pipe makers is being well maintained. Municipal lettings are in only fair number, but other branches of buying are good. Prices are making a better showing for the foundries and quotations generally are on a higher basis. A Newark, N. J., letting of about 5,000 tons of 16 to 24's, principally, and including 800 tons of high pressure pipe now has been distributed among R. D. Wood & Co., the United States Cast Iron Pipe & Foundry Co. and the Standard Cast Iron Pipe & Foundry Co. The former received the high pressure pipe and the Standard company the larger portion of the standard sizes. The Warren Foundry & Machine Co. and the Donaldson Iron Works have divided 1,000 tons of 36-inch for Salem, Mass., but the main portion of the large requirements for that city recently bid upon has been deferred until fall. The United States Cast Iron Pipe & Foundry Co. has taken 725 tons of 6 to 48's for New York City work from Rogers & McManus, the general contractors; 1,260 tons of 8 and 12's for Morgantown, N. C., at $21.65, delivered, and 940 tons of 4's for Lexington, Ky., at $20.75, delivered. The largest maker also is furnishing 400 tons of 6-inch for Manila, P. I., Waynesboro, Pa., is out for 140 tons of 10 to 12's, Chestertown, Md., for 110 tons of 4 to 10's and Harrison, Ark., for 1,400 tons of 4 to 12's to close June 25.

Little New Pipe Business

Chicago, June 8.—New business in cast iron pipe is comparatively small. Makers have accumulated considerable tonnage, which is being specified in gratifying volume. Cities apparently have covered their requirements fairly well and not many new projects are in prospect. Bids will be opened June 14 at Kenosha, Wis., on 2,500 to 3,000 tons of large size intake pipe and this is the only letting of consequence now in prospect.

Safety Movement

Will Be Given a Boost By Commissioner Noonan in Cleveland

Victor T. Noonan, director of safety of the industrial commission of Ohio, is planning an extensive safety campaign for the factories and workshops of Cleveland, beginning either Tuesday, June 15, or Monday, June 21, and continuing for a week or 10 days. Mr. Noonan will visit from 100 to 150 plants, giving a half-hour talk at each plant. It is estimated that at least 100,000 workmen will be reached in this way. The local committee in charge of arrangements consists of Philip Frankel, secretary of the Cleveland Foundrymen's Association; Stephen W. Tener, American Steel & Wire Co.; C. E. Pettibone, Pickands, Mather & Co.; J. H. Boggis, Taylor & Boggis Foundry Co.

Thomas D. West, chairman of the committee on foundry regulations for Ohio, has also received notice that an appropriation has been made to further the safety work in Ohio. The industrial commission will receive $5,000, and an additional $5,000 will be appropriated if the manufacturers of the state contribute a like amount.

Close for Last Half Iron

Pittsburgh, June 9. (By wire.)—Two Westinghouse interests, the Union Switch & Signal Co. and the Westinghouse Air Brake Co., have closed for fairly heavy tonnages of second half foundry and forge grades. It is understood that the purchases involve about 7,000 tons of foundry, malleable and gray forge iron, which was obtained at prevailing minimum quotations. Original inquiries sent out by the several Westinghouse interests have developed bids on 15,000 tons of foundry grades.

Electric Motor Companies Combine

Plans for the merger of the Baker Motor Vehicle Co. and the Rauch & Lang Carriage Co., both of Cleveland, two of the oldest manufacturers of electrical vehicles in the country, have been approved by the directors of the two companies. The merger will be affected by increasing the capital stock of the Rauch & Lang Carriage Co. to $2,500,000, after which the name of the company will be changed to the Baker, R. & L. Co. C. L. F. Wieber, president of the Rauch & Lang Co., will be president of the new company; Fred R. White, of the Baker company, first vice president, and E. J. Lang, second vice president.

Many Denials

From Men Who Know Follow Publication of Rumors

New York, June 9. (By wire.)—A fresh crop of rumors just appearing about Germans buying or negotiating for ammunition plants to stop shipments to allies are bringing out authoritative denials. President Schwab admits that some offers have been made for the Bethlehem Steel Co., but does not confirm the rumors relating to offers from Germans. Directors of the company say no German offers have been received. No one believes the Germans could buy the Bethlehem company.

Officials of Remington interests deny that any German offers have been made. The report that Schwab is nogotiating for the Cramp company is also officially denied.

Reorganization Progresses

A charter was issued on June 8 to the Alton Steel Hoop Co., a corporation organized under the laws of Illinois, with a capitalization of $5,000. The officers of the company are: W. C. Fownes Jr., president; E. J. Anglin, treasurer; M. L. Mozier, secretary, who, together with W. C. Fownes and J. B. Orr, comprise the incorporators of the company.

This is a preliminary step in the reorganization of the Alton Steel Co., Alton, Ill., which was placed in the hands of a receiver on July 8, 1914. The receiver was discharged on July 5 and the property of the company will be offered at public sale on June 29.

Will Confer on Wages

Pittsburgh, June 9. (By wire.)—Representatives of the Amalgamated Association will confer with sheet and tin plate manufacturers operating under association wage scales June 16, at Atlantic City, to consider wage schedules for the year beginning July 1. As soon as the sheet and tin plate scales are signed, the puddling scale will be considered.

Will Build New Plant.—The J. H. Day Co., Cincinnati, manufacturer of bakers', paint and laboratory machinery, has purchased a tract of 75 acres in Bond Hill, a suburb of that city, and will build a new plant to cost about $100,000, exclusive of machinery. Definite plans have not been made, but it is expected that building operations will be commenced in a few months. The company has found it necessary to secure larger and more modern quarters to take care of its increasing business. Its present plant is located on Colerain and Harrison avenues.

Personals

W. E. Corey, former president of the Steel Corporation was made a director of the International Nickel Co. at the annual meeting.

S. C. Ludwig, well-known in the eastern iron and steel trade, now is connected with the Philadelphia district sales office of the Cambria Steel Co., located in the Morris building.

Stewart M. Marshall has resigned as chief engineer of the Cambria Steel Co., Johnstown, Pa., to accept the position of manager of the turbine department of the Southwark Foundry & Machine Co., Philadelphia.

George C. Wilson, of the Independent Pneumatic Tool Co., Chicago, has been appointed manager of that company's Atlanta branch, vice F. H. Charbono, who has been transferred to Boston.

Merton A. Pocock has been appointed district sales manager of The Terry Steam Turbine Co., Hartford, Conn., with headquarters at 400 Endicott building, St. Paul. He will cover the states of Minnesota, North Dakota and South Dakota.

C. H. Morse Sr., more than 80 years old, has resigned as president of Fairbanks, Morse & Co., after serving in that capacity for 25 years. He is succeeded by his son, C. H. Morse Jr., but will retain his interest in the company and will act as a director.

E. W. Swartwout, formerly affiliated with the Chicago office of the Nordberg Mfg. Co., Milwaukee, now is associated with the New York office of this company, located in the Equitable building. The Chicago office of the Nordberg company will be in charge of John E. Lord.

Joseph J. Conlisk now is in charge of the Chicago office of the Columbia Steel & Shafting Co., Pittsburgh, located at 1334 Peoples Gas building, Chicago. Mr. Conlisk was formerly identified with the Pittsburgh Shafting Co., of Detroit, which is closely affiliated with the Columbia company.

W. E. Hartman, Webster building, Chicago, has been retained by the Youngstown Sheet & Tube Co., as consulting engineer on the construction of 204 coke ovens at Youngstown. Mr. Hartman is also consulting engineer on the construction of 424 ovens for the Lehigh Coke Co.

H. M. Easton, formerly connected with the Pope Tin Plate Co. as manager of sales, and later with the Impervious Sheet Steel Co. in the same capacity, has resigned to accept the position of special sales agent with the Phillips Sheet & Tin Plate Co., with headquarters at general office at Weirton, W. Va.

William B. Blowers, formerly district sales agent of the St. Louis office of the Youngstown Sheet & Tube Co., Youngstown, has been appointed to succeed Charles E. McInnes, who has represented the company for a number of years in the New York and Philadelphia district. Mr. McInnes resigned to engage in export business.

Will Enlarge Tin Plate Plant

The McKeesport Tin Plate Co., has sent our preliminary inquiries for equipment to the proposed extension to its tin plate plant at McKeesport, Pa. When completed, the plant will be the largest single tin plate plant in the world. It will contain 42 mills, plans providing for the addition of 20 tin plate mills and extensions to the boiler house, the bar runway and furnace building, the hot mill building, the opening building, the cold mill building and the warehouse.

Preliminary inquiries include structural material for the several buildings involving about 2,500 tons; nine electric cranes, having lifting capacities ranging from 5 to 20 tons; five engines; 20 mills; 20 squaring and 20 doubling shears and two 72-inch bar shears.

Gulf State Steel Co. Improvements

Important improvements are being made to the blooming mill department of the Gulf State Steel Co., Gadsden, Ala., which will balance up the rolling capacity of the plant with that of the open-hearth works. These enlargements pertain chiefly to the reheating capacity and include the installation of three more soaking pits, additional cranes, etc. With this additional equipment, the blooming mill department will be able to take up practically the whole output of the steel works, which heretofore it has not been possible to do. The Gulf State Steel Co. is enjoying a very good demand for blooms and slabs for export, especially to the British Isles, where its steel has met with favor because of the very suitable quality. Prof. Jas. Bowron, of the company, also reports that the domestic trade is expanding steadily.

Tested the Shape Market

And Could Not Shade Full Price—Such Was Experience of an Eastern Fabricator

Philadelphia, June 7. — A nearby fabricator with accumulated work for 1,500 to 2,000 tons for delivery during the next two to three months, has thoroughly tested out the plain structural shape market in this territory during the past week. This buyer, it is understood, was not able to develop better than 1.20c, Pittsburgh, and to have practically closed on that basis. Such instances as this are few, for sales by eastern Pennsylvania mills at 1.20c usually have been on small requirements not covered by contracts. All the large shape buyers in this territory are operating under contracts which are considerably below the present market. Specifications under these commitments are the main support for eastern Pennsylvania mill operations, now ranging from 65 to 75 per cent of capacity. New inquiry is less than recently, though the amount of small orders last week was better than the week preceding. Buyers still display no interest in building up stocks which generally are at a depleted stage.

Many Inquiries

New York, June 8. — Inquiries for structural steel in this and nearby districts while many of them are small, are in good number but contracts are not keeping up in proportion. A list of pending jobs that is lengthening weekly, now is presented. Loan money on building propositions temporarily, at least, is more difficult to obtain in this city, and this factor, undoubtedly, has much to do with the present delays in contracts. Extensions of war plants still bring out some fair tonnages, about 2,000 tons additional having been placed in the week for Bridgeport and New Haven companies, with about 1,500 tons still pending. The city of New York is putting out approximately a 4,000-ton requirement for East River piers in Brooklyn. Fabricated prices generally show little or no betterment and some quotations of the past week have been as low as any yet made. On a small power house up state, the successful figure was about 2.10c, delivered. Plain shapes remain at 1.369c, New York, or 1.20c, Pittsburgh, for June shipment and there is not much talk of concessions.

Future Shapes Command 1.25c

Pittsburgh, June 8.—Manufacturers of structural shapes in the Greater Pittsburgh district are asking 1.25c for third quarter delivery and it is not improbable quotations below that level for prompt delivery will be withdrawn within the next two weeks. Inquiries are numerous, but no large single orders have been booked recently. The building of steel cars and shops has materially strengthened the market far structural material.

Akron Contract Awarded

Cleveland, June 8.—Very few structural contracts are pending in this district. An addition to the plant of the Goodrich Rubber Co., Akron, O., 1,000 tons, for which the Osborn Engineering Co. is the engineer, has been awarded to the Hunkin-Conkey Construction Co. Bids on the new municipal court building, Detroit, 1,200 tons, are being received today. Competition is expected to be active.

Structurals are Weaker

Chicago, June 8.—Structural steel business is improving in volume and some attractive possibilities have appeared above the horizon in the past few days. Railroads are reviving several bridge projects which have been dormant for some time and these involve a large tonnage. The Burlington bridge from Metropolis, Ill., to Paducah, Ky., which was postponed a year ago, probably will be contracted within a few days, and as this involves approximately 18,000 tons, it will furnish almost two months' steady work at the capacity of the Chicago mill to which it probably will be awarded. Revival of activity in regard to the Illinois approach to the free bridge at East St. Louis, Ill., involves approximately 24,000 tons, and the Memphis bridge is another large tonnage. Contracts placed in the west involve almost 1,500 tons in small contracts. Prices on structural shapes continue slightly weaker than on bars and for future delivery 1.39c to 1.44c, Chicago mill, can be done.

CONTRACTS AWARDED.

Addition to the plant of the Goodrich Rubber Co., Akron, O., 1,000 tons, to the Hunkin-Conkey Construction Co., Cleveland.

Peoples Outfitting Co., store and office building, Detroit, 1,000 tons, awarded to the American Bridge Co.

Snider loft building, Boston, 200 tons, to Boston Bridge Works.

Additions to the Frankford Arsenal, Philadelphia, 250 tons, to the American Bridge Co.

Hyde loft building at Fortieth street and Madison avenue, New York City, 600 tons, to Levering & Gerrigues.

Bridge work for the Virginian railroad, 250 tons, to the Virginia Bridge & Iron Works.

Further extensions to the plant of the Winchester Repeating Arms Co., New Haven, Conn., 250 tons, to the Lackawanna Bridge Co.

Extensions to the plant of the Remington Arms Co., Bridgeport, Conn., 1,400 tons to the Phoenix Bridge Co.

Warehouse for Syracuse Cold Storage Co., Syracuse, N. Y., 500 tons, to Smith & Caffrey.

Apartment, Bedford avenue, Brooklyn, 250 tons, to the Wm. Schwenn Iron Works.

Shops for Maine Central railroad, Waterville, Me., 225 tons, to American Bridge Co.

Bridge work for the Baltimore & Ohio railroad at Indianapolis, 175 tons to the Massillon Bridge Co.

Building for American Radiator Co., Buffalo, 500 tons, expected to go to Lackawanna Bridge Co.

Chicago, St. Paul, Minneapolis & Omaha Ry. Co., bridge over the Mississippi river at St. Paul, Minn., 495 tons, to Milwaukee Bridge Co.

Chicago, Milwaukee & St. Paul Ry. Co. bridge at Tacoma, Wash., 359 tons, to American Bridge Co.

Cottonwood Coal Co. miscellaneous steel, Lehigh, Mont., 287 tons, to Milwaukee Bridge Co.

Corn Products Refining Co., buildings, Argo, Ill., 228 tons, to American Bridge Co.

CONTRACTS PENDING.

Office building, Yonkers, N. Y., 400 tons, bids being taken.

Bridges for Pennsylvania railroad at Baltimore, 200 tons, bids being taken.

Mill building for the Park Hill Mfg. Co., Fitchburg, Mass., 500 tons, bids being taken.

Loft building for the Langdon Estate, Houston street, New York City, 500 tons, bids being taken.

Bergen office building, the Bronx, New York City, 500 tons, bids being taken.

Theater, Pottsville, Pa., 200 tons; bids being taken.

Public bridge, Atlantic City, 550 tons, bids being taken.

Loft building for Alt Realty Co., West Forty-eighth street, New York City, 600 tons, revised figures being taken.

Four buildings for Winchester Repeating Arms Co., New Haven, Conn., 1,300 tons, bids being taken.

Building for Grand Union Tea Co., Brooklyn, 800 tons, bids being taken.

Work for traction interests, Manchester, N. H., 300 tons, bids being taken.

Loft building for Burton Bros., Twenty-ninth street and Broadway, New York City, 800 tons, award about to be made.

Three new piers, East river for city of New York, 4,000 tons, about to be placed. Bids on pier at Twenty-ninth street, due June 11. Other piers at Thirtieth and Thirty-fifth streets.

Municipal court building, Detroit, 1,200 tons. Bids to be received this week.

At the final meeting of the season of the Newark Foundrymen's Association, held at the Washington restaurant, Newark, N. J. last week, an address on the subject of First Aid was delivered by Dr. H. H. Satchwell, of Newark. Dinner was served preceding the address.

The office of the International High Speed Steel Co. has been removed from 478 Pearl street to the Bennett building, 99 Nassau street, New York City.

(*For complete prices see page* 1228.)

Lead Now Rivals Spelter

And Other Metals Are Falling into Line in the Excited Upward Movement of Prices

New York, June 8.—Practically all the metals now are ascending rapidly in price and there is great activity on all sides. The most excited metal now is lead, which has been advancing almost each day under the stimulus of a record-breaking demand, which comes chiefly from domestic consumers. The leading producer now is asking 5.75c, New York. Independent producers are asking heavy premiums; these interests already have sold June and July lead at 6c, New York, and now are asking 6c, St. Louis, equivalent to 6.17c, New York. Another advance by the leading producer, therefore, is expected.

Spelter again has registered new high marks. The demand for this metal has been far greater than the supply and consumers have been bidding the market up in their eagerness to cover for their requirements. The producers in most cases are sold up as far ahead as they care to go; they are following the practice, in many cases, of making sales as fast as they get in their ore. The spot market on prime western now is quotable at 28c to 29c, while futures over the next two or three months are held at no less than 28c. On the last three months of the year, 27c has been paid. Brass special for the next two or three months has been selling at 30c.

The copper market has developed further activity due to rather heavy demand from domestic consumers, and as a result producers again are putting up their prices. Electrolytic is quotable at 19.50c to 19.62½c, delivered 30 days. Best brands of casting copper are held at 19c, delivered 30 days, and cheaper grades at 18.25c to 18.50c, cash. The best grades of lake copper are held at 23c to 24c, cash, ordinary grades at 19.50c to 19.75c, cash, and arsenical grades at 19.37½c to 19.50c, cash.

Antimony has been somewhat excited by high prices on futures cabled from the far east, but lower prices have been offered the last few days. Spot Chinese and Japanese are quoted nominally at 35c to 37c, duty paid. Futures from the far east now can be had in limited tonnages at about 33.50c to 34c, in bond.

It continues difficult to secure aluminum for spot or nearby shipment due to the extent to which the domestic producer is sold ahead and the fact that very little aluminum is being imported. Second sellers are doing 28c to 30c on spot less-than-carload lots.

A large business in tin has been done the last few days by speculative interests, but it does not appear that consumers have bought much of the metal. This is due to the fact that importers are selling futures only "to arrive", and are not guaranteeing delivery. As a result there is a large unsatified demand and the market is strong. No prices are heard on spot. June is offered at 40.25c, and July at 38.62½c to 39c.

Bolt Prices

Are Advanced on Account of Improvement in Demand

Cleveland, June 8.—Owing to the improvement in demand, prices on small bolts have been advanced 5 per cent, while on the larger sizes, an advance of 2½ per cent has been made. No change has been made in prices of nuts. Active demand from automobile manufacturers for bolts is responsible to some extent for the improved conditions and manufacturers say that if the railroads were to do a fair amount of buying, the trade would be in a very prosperous condition. There is not much activity in rivets at the present time, but numerous contracts will expire July 1, and it is expected that there will be considerable contracting in the near future. Specifications on rivets are not very heavy at present.

Purchases Ewald Iron Co.

R. Baylor Hickman, acting for himself and associates, purchased 2,955 shares of the 3,000 outstanding shares of the stock of the Ewald Iron Co., at a public auction in Louisville, June 3, paying $214.17 a share. This is the price at which the stock was purchased by Mr. Hickman from the Fidelity & Columbia Trust Co., at a private sale several months ago. Some question was raised, however, as to the value of the stock and the court ordered it sold at public auction. The company operates a bar iron plant which has long been considered one of the best in the country. Mr. Hickman is president of the company.

Wants Bands and Sheets.—The Cincinnati Steel Furniture Co., Arlington Heights, Cincinnati, is in the market for the following materials, which will be purchased at an early date: 20,000 feet of ¾-inch hot rolled channel iron; 10,000 feet of ⅛ x 1-inch band iron; 5,000 feet of ⅛ x ⅝-inch band iron; 5,000 feet of ¼ x ⅜-inch band iron; 5,000 feet of ¼ x ½-inch band iron, and three cars of sheets, 24 and 28-gage.

Pennsy Rails

Not Yet Placed—Car Orders Not Coming in Rapidly

New York, June 8.—Action on the 138,000-ton rail inquiry of the Pennsylvania railroad still is hanging fire although it appears reasonably certain that the distribution is near at hand. In some quarters it is believed that the order may be placed before the present week ends. Other rail business in sight or being placed is of limited tonnage. The Pennsylvania Steel Co. has received 2,000 tons of the recent Norfolk & Western order. Bids go in June 11 on 2,500 tons for subway and elevated railroad extensions in New York City.

Car orders also have not been keeping up to predicted betterment and the equipment market is far from being active. The International & Great Northern has distributed its 1,000 cars to the Mt. Vernon Car Mfg. Co., including 500 box, 300 stock and 200 gondolas. The Pressed Steel Car Co. has received 100 box cars for the Long Island railroad. The Norfolk & Western has ordered 18 passenger equipment from the American Car & Foundry Co. The Delaware & Hudson is asking for 18 passenger types. The inquiry for the Havana Central calls for 500 flat and 100 box cars. The large Russian car order still is subject to negotiations.

In locomotives, the New York, Ontario & Western has placed 12 of the Santa Fe type with the American Locomotive Co. The Baldwin Locomotive Co. has taken two switchers, one for Cuba and the other for Columbia.

The Norfolk & Western railroad has closed for 2,000 to 3,000 kegs of standard railroad spikes for last half shipment.

The Ohio Wood Preserving Co., Commonwealth building, Pittsburgh, has received a contract for the wood block paving for bridge No. 2 over the Allegheny river at Pittsburgh.

The Standard Bridge Tool Co., Pittsburgh, manufacturer of Thomas spacing tables, has removed its offices from the Bessemer building to the Fulton building. The new quarters are larger and have been specially arranged to suit.

(*For complete prices see page* 1228.)

Steel Corporation Decision Approved

(*Continued from page* 1141.)

the decision denying the right of the government to dissolve the Steel Corporation, as demonstrated by the sentiment of the past few days at New York, Philadelphia, and other eastern business centers. There is a general feeling that in this decree of the court has been established a legal precedent which goes farther towards defining the proper limits in which big business enterprise may be conducted without fear of federal interference than any other application or interpretation of the Sherman anti-trust act that yet has been made by the courts. As the Standard Oil and American Tobacco decrees laid down the rule where certain competitive acts and policies of management were contrary to public welfare, so the Steel Corporation decision, it is pointed out, has clarified the reverse side of the proposition and has made it certain in an emphatic way that large corporations have nothing to fear from the law if they are properly conducted, and that therefore enterprises that are so conducted and are meant to be honest in all respects, are placed in an assured position regardless of size. It is felt that the Steel Corporation in fighting and winning this suit against the government has accomplished a service of almost inestimable value to the business world of the United States. Inferentially, this impression represents a great compliment to the sound workmanship of the Organization and of the able and broad-gaged management of the Steel Corporation, since it now will serve as a model for that which is best, wise and safe in the conduct of large business affairs.

This broader view of the good results to flow from the Steel Corporation decision in lighting the way and in restoring confidence for the general commercial world supersedes in importance at this time in the average business mind the immediate effects that are likely to be imparted by the finding upon the volume of current trade. As a force in enheartening courage and in revivifying confidence, it is accepted as obvious that the consequences will be most salutary, and that the good to the nation's business position will be steadily cumulative for that reason. In iron and steel circles, where a greater effort has been made to measure the precise effects of this development, the most cheerful deductions are being drawn. The expression not infrequently is being heard among iron and steel producers of the east that the Steel Corporation victory is the greatest single boon to the industry that could have come at this time. Some makers see in this influence a genuine tonic in enspiriting and stimulating domestic iron and steel trade to something like its normal confidence and vigor, especially as it pertains to future requirements. Among the more optimistic, further price advances for various iron and steel products are expected before many days. Some pig iron men express the belief that pig iron is destined to rise from the slough under the circumstances now present, and a prediction of a general rise of $1 a ton in price is by no means confined to one or two producers. While it cannot be said that the decision has been one of the prime causes for the practically 50-cent advance in basic iron in eastern Pennsylvania, because this rise first was apparent about a week ago, it would seem that its cheerful effect upon makers has had something to do with the better establishment of the higher level through further buying during the past few days. Similarly the determination of eastern makers to advance standard low phosphorus iron 50 cents a ton, which was put into effect this week seems to have been strengthened by this development.

Among eastern buyers of iron and steel products, the influence of the decision apparently has been to inspire greater confidence in the future, for there has been an appreciable increase in the inquiries for last half and last quarter which have been met usually by an attitude of the makers to proceed more carefully and to ask $1 a ton more for such deliveries.

Will Take New Heart

Chicago, June 8. — News of the sweeping decision in the United States district court at Trenton, N. J., refusing to dissolve the United States Steel Corporation and giving it a clean bill of health, has been received by Chicago business men as a good omen. It is universally taken to mean mere bigness is not a detriment in business and that large aggregations of capital can breathe more easily and proceed with greater safety and without fear of the governmental ax falling to sever them into smaller parts.

The pending cases involving the Corn Products Refining Co. and the American Can Co. apparently present so many parallels with the case against the Steel Corporation that this decision is taken to forecast a similar result for them, but business men generally who have followed "anti-trust" legislation and court decisions see in the present case a strong tendency of the courts to decide each case on its individual merits.

With the uncertainty of this litigation removed, it is believed all business will take new heart and proceed along more active lines.

"Drop It," Says Birmingham to President

Birmingham, June 9. (By wire.)—The chamber of commerce has adopted resolutions petitioning President Wilson to drop the suit against the Steel Corporation. It is felt that a continuance of the litigation will cost the Birmingham district valuable time on new work, for the Steel Corporation is not expected to carry out the plans in mind until the dissolution suit is settled. The board of trade is to add its appeal.

"No good result can come from a further prolonging of the litigation," says the resolutions.

South is Enthusiastic

Birmingham, Ala., June 7.—Industrial circles in the Birmingham district have received with enthusiasm the decision of the United States court at Trenton declining to dissolve the United States Steel Corporation.

Leaders in the industrial world say it is one of the biggest things that has ever happened for the Birmingham district, and there is a general feeling that either no appeal to the supreme court will be made or else, if such is done, that the decision will not be reversed. President George Gordon Crawford, of the Tennessee, Coal, Iron & Railroad Co., expresses his extreme gratification, but has excused himself so far from making any detailed comment on the case. The absorption of the Tennessee company in 1907 by the Steel Corporation made up an important part of the case.

Better Days Coming

Cincinnati, June 8.—The consensus of opinion in the iron and steel trade at Cincinnati is that the decision of the circuit court in the case of the United States government against the United States Steel Corporation, in favor of the defendant, will have a good effect upon business. The uncertainty of the markets that has been a feature in that city for more than a year, is blamed largely upon the threatening and antagonistic attitude of the United States government and the state legislature against big business.

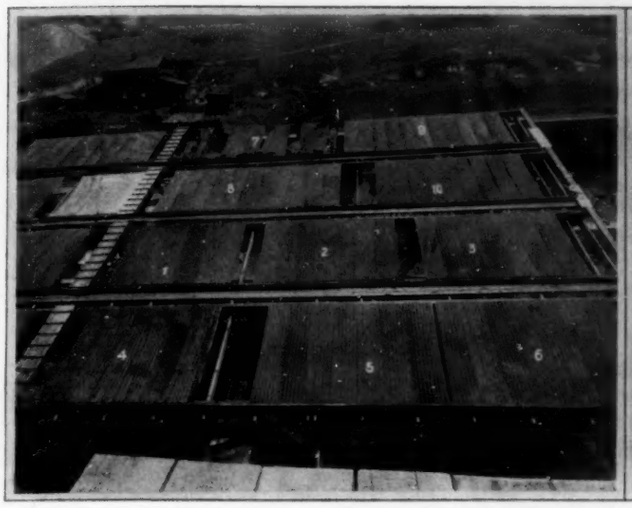


FIG. 1—SHEETS IN COKE REGION AFTER SEVEN MONTHS' EXPOSURE

FIG. 2—SAME SHEETS AS IN FIG. 1 AFTER ONE YEAR'S EXPOSURE

Tests for Corrosion Resistance

Data Covering a Series of Experiments on Steel Sheets—Effect of Various Elements Discussed—Copper Beneficial

BY DANIEL M. BUCK

THE physical properties of iron and steel may be changed almost at will to meet the largely diversified requirements of consumers. Hardness, strength and elasticity may be varied by the introduction of carbon. Machining operations may be greatly benefited by the introduction of sulphur in reasonable amounts; by silicon additions, electric properties are improved; and the ductility is increased by the introduction of copper. By judicious alloying with nickel, chromium, tungsten, molybdenum, manganese, etc., projectile-resisting armor plate, high-speed steels and manganese steel, which is so useful in resisting abrasion, are obtained. By varying the forming and heat treatment operations, the properties of steel may be further modified and this wonderful metal made to serve man's ends.

But there is one property which steel and iron do not possess—that of stability when exposed to the action of air and water. In an effort to combat this tendency of iron to return to its original oxide form, much serious thought has been given by metallurgists and students of corrosion problems. We believe that all are agreed that the ideal condition is to so protect the surface of the ferrous materials as to permanently exclude the corrosive elements. To attain this Utopian condition, protective coatings of various types are used.

Inasmuch as no absolutely rust-proof steel or iron has ever been devised, the writer recommends that, wherever possible, construction ma-

A paper presented at the spring meeting of the American Iron and Steel Institute. The author, Daniel M. Buck, is metallurgical engineer, American Sheet & Tin Plate Co., Pittsburgh.

FIG. 3—SAME SHEETS AS IN FIG. 1 AFTER THREE YEARS' EXPOSURE

FIG. 4—ANOTHER SERIES OF SHEETS AFTER TEN MONTHS' EXPOSURE

FIG. 5—THE SAME SHEETS AS IN FIG. 4 AFTER 16 MONTHS' EXPOSURE

FIG. 6—A RECENT SERIES AFTER NINE MONTHS' EXPOSURE

terials which are to be exposed to corrosive influences be protected by a metallic coating, a suitable paint or both. There are, however, conditions when such a protection is either not possible or not desirable, and it is also true that film coatings, on account of their liability to be removed by accident and abrasion, and by the action of the weather, form only a more or less temporary protection. Consequently, much thought has been given to the possibility of producing a steel or iron which in itself possesses corrosion-resisting properties.

After years of research, investigation and practical experience, there is, unfortunately, at the present time not a complete unanimity of opinion on this subject. This difference of opinion is the result of several causes, some of which are avoidable. These causes may be grouped as follows:

1. An undue adherence to some particular theory without practical demonstration of the value of the theory.

2. An undue and reprehensible adherence to a particular class of product with which the investigator may be interested financially or otherwise.

3. Placing too much confidence in accelerated tests.

4. Losing sight of the fact that even under the best practice, heats below the average are manufactured, and that consequently conclusions drawn from a comparison of a good heat of one type with a poor heat of another type should be avoided.

5. Drawing general conclusion from results obtained under peculiar conditions, which may or may not be in any way representative.

The adherents of the different schools are divided into four main classes as follows: Those who believe in genuine iron, the product of the puddling furnace; those who believe in normal mild steels, the product of the open hearth and bessemer furnaces; those who believe in so-called pure irons, the product of the open hearth furnace, in which the carbon and manganese are reduced to a minimum, and to which copper may or may not be added; and those who believe in normal open hearth and bessemer steels with which has been alloyed a small amount of pure copper. Attempts have also been made to use nickel as the alloying element.

The writer, who is associated with the American Sheet & Tin Plate Co., after many years of careful study and investigation, is one of the firm believers in the fourth type mentioned—copper alloy steels.. Our investigations have dealt principally with the exposure and observation of full-sized sheets, unprotected in any way, under service conditions. Many different heats have been used in our work, thus eliminating the chance of accidental results. The majority of our tests have been made under atmospheric influences. We realize that it

FIG. 7—ANOTHER PART OF THE SERIES SHOWN IN FIG. 6

FIG. 8—A THIRD PART OF THE SERIES OF SHEETS SHOWN IN FIG. 6

is impracticable to make tests under all of the many varying conditions, and believe that atmospheric corrosion is the most important, especially when considering structural material in general and sheets and plates in particular.

About five years ago, in testing the corrosion resistance properties of sheets made from electric furnace steel, it was noticed that one heat of steel which contained about 0.07 per cent copper was markedly superior to the others in its resistance to corrosion. Some further work indicated that the results obtained were not accidental, and that the copper was probably the controlling factor. To remove the last element of doubt, several heats of both bessemer and open hearth steel were used and copper added in varying amounts to some of the ingots as they were poured, while to other ingots of the same heat no additions were made. Careful surveys of both the bars and sheets rolled from these ingots proved that the diffusion of the copper under these conditions was practically perfect. These ingots were rolled into 16-gage and 27-gage sheets and exposed to the atmosphere in the Pennsylvania coke regions, at Atlantic City, N. J., and along the Allegheny river above Kittanning, Pa., thus obtaining widely varying conditions of atmosphere.

Fig. 1 shows 27-gage sheets after about seven months' exposure in the coke region.

Fig. 2 shows the same roof after about one year's exposure. Fig. 3 is made from a photograph of the 16-gage sheets taken in February, 1915, after a little more than three years' exposure. The copper-bearing panels are, after three years' exposure, nearly as good as when first installed, and, so far as we are able to determine by observation, have not changed in any way in the past two years. Similar results were obtained at the other two test stations.

On March 4, 1913, a second series of sheets was exposed in the Pennsylvania coke regions, and Figs. 4 and 5 are made from photographs taken after 10 and 16 months' exposure.

The writer, collaborating with J. O. Handy, is at present conducting a corrosion test in two different localities. In these tests are included 700 full-sized sheets of 44 different characters of steel. This test should be completed in approximately six months and will no doubt give us some additional valuable information, which will be made the basis of a subsequent paper. In this series we have included copper additions in amounts from approximately 0.04 to 2 per cent, and we have also made additions of sulphur, phosphorus, aluminum, silicon, mill scale and steel turnings. Although the sheets have been exposed only about 10 months, and we have not yet completed our observations, we are able to draw some interesting conclusions.

Figs. 6, 7 and 8 show three sections of one of these test racks after about nine months' exposure. Panels 15 and 16 are from the same heat of bessemer steel, which carried 0.14 per cent residual sulphur. Panel 15 has 0.25 per cent copper, and panel 16 0.008 per cent copper. Panels 17 and 18 are from another heat of bessemer steel with 0.052 per cent residual sulphur; panel 17 is copper-bearing and panel 18 contains 0.004 per cent copper. It will be noticed that, considering the plain steels, panel 16 (high sulphur) has corroded much faster than has panel 18 (normal sulphur); while it is interesting to note that there is no difference discernible between panels 15 and 17, both copper-bearing. Up to the present time the sheets with high copper content, up to 2 per cent, are not showing any better corrosion resistance than those containing only 0.25 per cent; and, indeed, from present indications the beneficial influence of the copper content is quite marked down to at least as low as 0.04 per cent. Panel 8 has silicon added and is failing badly, as are also panel 9 with an aluminum addition, and panel 10, with a sulphur addition. As was expected, the addition of steel turnings to the molten steel has been of no benefit.

From our work to date we are prepared to draw the following conclusions as to the influence of the varying metalloids in steel sheets when exposed to the atmosphere. Although there has been no attempt made to determine directly the carbon influence, it seems that in the low ranges present, 0.02 to 0.14 per cent in mild open hearth and bessemer steel, carbon has little influence. While the writer is aware that some metallurgists advance the theory that manganese is detrimental to steel in its corrosion resistance, we neither agree with the theories advanced nor have we observed the slightest evidence or proof that such claims are justified.

Much the greater part of the manganese present in steel exists alloyed with the iron, in which form we would not expect it to influence corrosion as far as the electrolytic theory is concerned, since two materials differing chemically or mechanically are required to start electrolysis, and these conditions are not obtained by simple alloying. Some of the manganese unites with sulphur, forming manganese sulphide, which exists in isolated patches and which is at best only a feeble conductor of electricity, and as such should stimulate corrosion to only a slight extent, if at all. It is possible that these patches

Table I.

Relative Losses on 2 x 4-inch Pieces

Exposed in coke regions November 21, 1911, and taken down August 14, 1912. Each result is the average of six pieces.

(Mill scale was removed from all samples before exposure, and all were cleaned with ammonium citrate solution before final weighing.)

Grade.	Panel	Ga.	Analysis C	Mn	S	P	Cu	Position	Relative Losses, 100 Equals Greatest Corrosion
Bessemer	8	27	0.05	0.44	0.082	0.101	0.23	1	39.09
Bessemer	9	27	0.05	0.44	0.075	0.099	0.34	2	39.61
Bessemer	9	16	0.07	0.46	0.069	0.095	0.33	3	41.57
Open Hearth	5	27	0.10	0.46	0.035	0.043	0.17	4	42.09
Open Hearth	6	27	0.07	0.47	0.038	0.043	0.25	5	42.22
Open Hearth	3	27	0.06	0.33	0.035	0.018	0.25	6	43.27
Open Hearth	2	27	0.06	0.35	0.036	0.018	0.16	7	43.92
Bessemer	8	16	0.08	0.45	0.070	0.094	0.21	8	44.05
Open Hearth	6	16	0.14	0.46	0.038	0.043	0.27	9	46.67
Open Hearth	5	16	0.13	0.44	0.035	0.042	0.18	10	46.67
Open Hearth	3	16	0.10	0.35	0.033	0.019	0.23	11	47.32
Open Hearth	2	16	0.10	0.34	0.035	0.020	0.16	12	48.36
Low Carbon and Low Manganese Material	10	27	0.02	0.03	0.036	0.003	0.07	13	50.19
Low Carbon and Low Manganese Material	10	16	0.03	0.03	0.034	0.003	0.06	14	53.20
Open Hearth	4	16	0.13	0.45	0.035	0.042	0.00	15	74.64
Open Hearth	4	27	0.09	0.47	0.037	0.043	0.00	16	78.16
Bessemer	7	16	0.08	0.46	0.070	0.098	0.00	17	91.64
Bessemer	7	27	0.05	0.45	0.076	0.100	0.00	18	96.86
Open Hearth	1	16	0.10	0.34	0.034	0.019	0.00	19	98.82
Open Hearth	1	27	0.06	0.35	0.033	0.018	0.00	20	100.00

of manganese sulphide, when they occur at the surface of the steel, or as they become exposed by the wasting of the steel, become oxidized to sulphates, in which form the efficiency of the moisture as an electrolyte would be increased. This action, however, is due to the presence of sulphur and not to the presence of manganese. Sulphur in steel must exist in combination, and if there is not sufficient manganese present, it will unite with the iron, forming iron sulphide, in which form it will be at least as harmful as in the form of manganese sulphide. Tests made by Burgess and Aston indicate that manganese alone in steel rather lessens than hastens corrosion.

We are convinced that, of all the metalloids commonly present in steel, sulphur, especially when present in abnormal amounts, is the most harmful from a corrosion standpoint. It exists as sulphides of manganese or iron, and our experiments show that in non-copper steels as the sulphur increases up to 0.18 per cent corrosion is hastened.

Although it is undoubtedly true that by increasing the phosphorus content of steel the resistance to sulphuric acid is lowered, yet our work indicates that whatever slight influence it may have in atmospheric corrosion is rather beneficial than otherwise, especially when the phosphorus has been added to the steel.

Silicon in the small amounts normally present in open hearth and bessemer steels is innocuous. However, experiments made by adding silicon in the amount of 0.15 per cent and 0.30 per cent show that the corrosion rate is distinctly increased by silicon in these amounts.

Copper

It is quite generally conceded if copper is properly added to molten steel to the amount of approximately 0.25 per cent, the life of the steel under atmospheric conditions is greatly increased. While definite figures from actual losses on weighed test pieces indicate that this increased life is approximately 100 per cent, we are of the opinion that this figure is low. We have reached this conclusion from observations of copper-bearing steels after several years' exposure. It appears that the rate of corrosion of copper-bearing sheets lessens as the time of exposure increases, and that the loss during the first six months' exposure is greater than during subsequent periods.

Any unprotected iron or steel will develop a thin film of rust in a few minutes when exposed to moisture and oxygen. This oxide film is electro-negative to the underlying metal and will stimulate further corrosion. Moreover, the physical characteristics and texture of this rust film are very important factors in governing the rate of corrosion of the metal. The rust formed on copper-bearing steel is dark brown, closely adherent and smooth, and if it does not really act as a protector to the underlying metal it is at least much less an accelerator than is the rust on a normal steel or iron, which is a limonite red in color, rough, loose and spongy in character. That the latter holds water to a greater extent is strikingly demonstrated by examining sheets which have been exposed for several months, both with and without copper, immediately after a rain. Copper-bearing sheets dry very quickly, while the loose, spongy rust on the sheets without copper holds the moisture for a considerable time, allowing corrosion to proceed for several hours after it has ceased on the copper alloy sheets.

To summarize conclusions from our work up to the present time: The influence on corrosion of carbon, manganese, phosphorus and silicon in the amounts normally present in properly made steels and irons is practically negligible. In a steel without copper, high sulphur content stimulates corrosion. A copper content of 0.25 per cent materially increases the life of steel and iron, and the harmful effect of sulphur up to at least 0.14 per cent is neutralized by 0.25 per cent copper. More copper, up to 2 per cent, gives little, if any, additional benefit. Lesser amounts than 0.25 per cent have great influence in lowering the corrosion rate. A content of 0.15 per cent is in most cases quite as good as 0.25 per cent, and tests now under way prove that much lower amounts, down to as little as 0.04 per cent and 0.06 per cent, while not giving the best results, are superior to normal steels carrying only the usual traces of copper.

Careful study is being made to determine definitely, if possible, the mechanism of the reactions which take place by alloying copper with steel

Table II.

Corrosion Tests on 2 x 4-inch, 27-Gage Test Pieces.

Exposed to weather for eight months at Scottdale, Pa.
The results are the average of eight tests of each grade.
(Mill scale was removed from all samples before exposure, and all were cleaned with ammonium citrate solution before final weighing.)

Grade.	Analysis						Loss in Oz. Per Sq. Ft.	Rank	Relative Losses, 100 Equals Greatest Corrosion	Condition of Test Pieces After Exposure.
	Carb.	Mang.	Sul.	Phos.	Sil.	Copper.				
V Bessemer	0.04	0.39	0.078	0.114	.....	0.31	3.15	1	42.63	No Holes
E Open Hearth	0.04	0.30	0.043	0.065	.....	0.31	3.24	2	43.84	No Holes
ZZ Open Hearth Unannealed	0.11	0.45	0.049	0.099	0.011	0.25	3.32	3	44.93	No Holes
Z Open Hearth Annealed. Same heat as ZZ	0.04	0.43	0.049	0.099	0.011	0.25	3.33	4	45.06	No Holes
H	0.042	0.16	0.024	0.003	.....	0.21	3.39	5	45.87	No Holes
D Open Hearth	0.06	0.50	0.037	0.016	.....	0.26	3.50	6	47.36	No Holes
C Open Hearth	0.06	0.33	0.035	0.018	.....	0.25	3.51	7	47.50	No Holes
O	0.027	0.07	0.033	0.007	.....	0.09	3.69	8	49.93	No Holes
W	0.049	0.05	0.043	0.005	.....	0.10	3.88	9	52.50	Holes in two Pieces
I Charcoal iron	0.03	0.06	0.013	0.052	0.039	0.07	4.04	10	54.67	Holes in three Pieces
J	0.022	0.03	0.031	0.006	.....	0.034	4.12	11	55.75	Holes in one Piece
F Reworked Muck Bar	0.04	0.07	0.023	0.134	0.162	Trace	4.66	12	63.06	Few Holes in all
YY Open Hearth Unannealed	0.11	0.45	0.048	0.096	0.007	Trace	5.11	13	69.15	Many Holes in all
Y Open Hearth Annealed. Same heats as Z and ZZ	0.04	0.45	0.046	0.099	0.006	Trace	7.39	14	100.00	Only lace work left

Discussion by G. H. Charls

CO-OPERATION should encourage a free discussion of questions on which there is a sincere difference of opinion, especially when such discussions enlighten and tend to raise the quality of American products. It is indeed very gratifying to observe that Mr. Buck has proved so conclusively in his second table that 27-gage open hearth iron has at least twice the life of steel. No one can justly accuse the author of this paper of being an ardent advocate of pure iron. Even I am unwilling to admit he was biased in favor of open hearth iron. This truth becomes more remarkable when you are informed that 27-gage black open hearth iron is not even advocated by its producers because it cannot always be rolled satisfactorily. This is explained by the fact that open hearth iron is so soft, so ductile and welds so readily the 27-gage sheets stick fast together in rolling and are often damaged when torn apart.

Due to the courtesy of Mr. Buck, a sheet taken from this lot which was to be tested came under my observation. In measuring the thickness of this sheet is proved to be nearer 28-gage than 27-gage in many places, due to the difficulty of obtainnig a uniform gage in rolling such light material.

It is therefore doubly gratifying to note the splendid record made by this light weight 27-gage open hearth iron, pickled before it was tested to almost a tissue paper thickness, made under protest and against the advice of its producers and in every way unworthy of being considered a representative product by any fair-minded person. If under such adverse conditions open hearth iron outlasts steel two to one, it must be graciously conceded that the claims made for this product have been thoroughly substantiated and sustained. I am glad one who is not an advocate of pure iron has made clear to the world at large that all previous criticisms and efforts to belittle the serviceability and durability of pure iron have been due either to prejudice or a lack of knowledge of this important subject.

The author of this discussion, G. H. Charls, is vice president, The American Rolling Mill Co., Middletown, O.

Discussion by J. O. Handy

WHILE it was known in a general way previous to Mr. Buck's researches, that copper exercised a retarding influence upon the corrosion of steel, this knowledge was based on only a very few experiments made with steel higher in carbon than the steel of which sheet roofing, etc., is made. Mr. Buck's work has established the superior corrosion resistance of low carbon steels containing copper. He has shown clearly that either basic open hearth steels or bessemer steels are made more than twice as durable under weather exposure conditions by the addition of 0.25 per cent copper. In the course of experiments which Mr. Buck and I have have made, it has developed that basic open hearth steel containing as little as 0.04 per cent copper is as resistant to corrosion as basic open hearth pure iron containing the same amount of copper. This fact seems to establish that copper is the controlling element in the corrosion of iron and steel.

When the amount of copper is still further decreased so that it falls below 0.03 per cent, we know that in the case of either basic open hearth or bessemer steel or basic open hearth iron, containing the usual amounts of sulphur, the influence of copper is lost and they all corrode very rapidly, the rates being in the order of their sulphur content.

It is interesting to speculate as to the cause of the efficiency of copper as a rust retarder in steel or iron. We feel sure from our researches that the oxygen content of the steel, as shown by the Ledebur test, is not diminished by the addition of copper, nor do we believe that dissolved oxygen or oxide is the controlling factor in steel corrosion.

We feel certain that in some way the accelerating effect upon corrosion exercised by sulphur in steel is entirely inhibited by the addition of copper. The most probable theory is that copper unites with the sulphur and the copper sulphide dissolves in the excess copper, and the mixture dissolves in the steel itself. The sulphide of copper is not as readily oxidized as sulphide of iron or sulphide of manganese and copper itself is extremely weather resistant. The steel therefore is far less readily oxidized than when the sulphides of iron or manganese are present in the steel. This suggests the idea that copper may now be intentionally and intelligently used to combine with sulphur in steel, and probably to add to the steel other valuable qualities beside corrosion resistance. The ideal, of course, is not corrosion retardation,

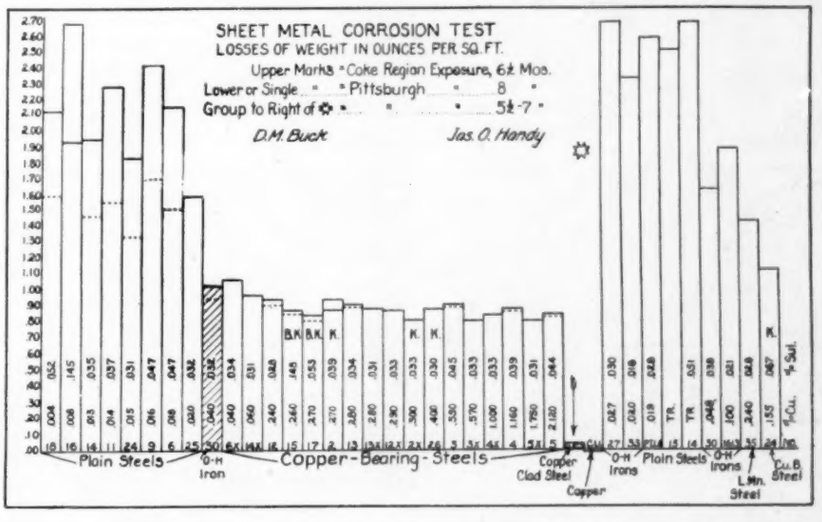


FIG. 1—DIAGRAM SHOWING RESULTS OF SHEET METAL CORROSION TESTS

The author of this discussion, J. O. Handy, is director, chemical laboratories, Pittsburgh Testing Laboratory, Pittsburgh, Pa.

only, but the prevention of corrosion.

Exposure tests made at the Pittsburgh Testing Laboratory have shown that copper and copper-clad or copper-covered steel resist the Pittsburgh climate satisfactorily. We find no material loss of weight after 18 months exposure, while during that time, all of the plain steels have disappeared, and open hearth irons and copper-bearing steels have undergone large losses of weight by corrosion.

Now that it has been shown that the electrolytic theory of corrosion does not prevent basic open hearth irons low in copper from corroding as rapidly as common steel, and as it has also been shown that bessemer steel high in phosphorus and sulphur, but containing 0.25 per cent copper, is even more weather resistant than copper-bearing basic open hearth iron, we ought not to be afraid to test rigidly the theory that copper-covered steel will corrode rapidly because copper is electro-negative to iron. I refer to copper-covered steel in which the copper covering is welded to the underlying steel. Our own exposure tests show that such material is as durable as copper itself, except at sheared edges, and at these points there is no evidence of more than the ordinary corrosion of exposed steel.

What Tests Show

By the exercise of sufficient mechanical ingenuity in manufacture, I feel sure that perfect copper-covered steel sheets can be made, and that they will be a very valuable material for the manufacture of roofing, culverts, etc.

Fig. 1 shows the great superiority in corrosion resistance of copper-bearing steels and open hearth irons, when compared with plain steels or plain open hearth irons. This illustration shows clearly that there is no material difference between plain steels and plain open hearth irons containing less than 0.03 copper. Both materials corrode with great rapidity. The critical percentage at which copper begins to control the corrosion of steel is between 0.03 and 0.04 per cent. The difference is very striking. The corrosion rate is 10 per cent higher in the case of steels or irons containing less than 0.03 per cent copper, as compared with those containing over 0.04 per cent. This illustration shows graphically that in a more impure atmosphere, the plain steels corrode much more rapidly, while the copper-bearing steels do not. The marked influence of sulphur on the corrodibility of the plain steels is shown most clearly by this comprehensive diagram.

Discussion by William H. Walker

THE AUTHOR of the paper under discussion states one of the causes to which we may attribute the fact that we are not yet in full accord as to the factors which control corrosion, to be, "An undue adherence to theory without practical demonstration of the value of the theory". I would like to paraphrase this to read, "An undue emphasis on one corollary of a theory to the complete exclusion of other equally important factors". The electrolytic theory, on which is based the modern conception of the corrosion of iron, predicates this chemical reaction:

Metal + Water = Hydrogen + Metal-hydroxide.

Here are four factors, all of great importance, each one of which may, under certain conditions, become controlling. But some worthy exponents of the electrolytic theory have considered only the first, namely the metal, and have ignored the influence of the others, especially the hydrogen and the metal hydroxide. This has led to erroneous conclusions regarding the important factors which accelerate and retard corrosion.

Taking the case of iron, the electrolytic theory assumes that at certain points the iron passes into solution in the water, and at certain other points an equivalent amount of hydrogen plates out. If there exists on the iron a speck of mill scale, or any other electrical conducting material on which hydrogen can deposit easily, a tiny electric cell is set up and the action proceeds at a rapid rate. In general this assumption is entirely correct. But some enthusiastic disciples of the theory, and I was one of them, made the wholly unwarranted assumption that every ingredient in iron or steel which was not metallic iron itself, would function in this way; and hence the conclusion, that the purer the iron the freer it would be from such electrolytic poles, and, therefore, the slower it would corrode.

Straining a Theory Beyond the Elastic Limit

But here is where we strained the electrolytic theory to beyond its elastic limit. We paid no attention to the effect which these ingredients, not iron, might have on the solution pressure of the iron, or upon the depolarization of the hydrogen, or the character of the iron-hydroxide formed. In the first place to be accelerators of corrosion these metalloids, as we call them, must be good conductors of electricity; and this we now know is not the case. Second, to be effective they must be segregated into individual particles, not alloyed with the iron, and generally they do not so exist. Third, and very important, not only must the hydrogen be plated out on such points, but it must also easily depolarize, that is, unite with the oxygen in the surrounding medium and disappear so that more hydrogen may deposit. In other words, the so-called impurities in iron and steel are not the active factors we at first thought they were, and eliminating these impurities has not brought the result which the theory at first led us to expect. We considered but a part of the theory, not the whole.

Our disappointment in the matter of results has, however, been relieved by the wonderful effects obtained by alloying with the steel a very small amount of copper. We have, for a number of years, carried on at the Institute a large amount of investigation work upon this copper-steel, both in the laboratory and in the field, and we can substantiate the results which Mr. Buck has obtained and has reported in his paper. I desire at this time to call attention to the fourth factor of the electrolytic theory, and which has received almost no attention; that is the influence of the metal-hydroxide, which is formed, on the rate of corrosion. We find that the film of iron-hydroxide or rust which forms on a plate of copper-steel is much denser, and depolarizes much more slowly than does that on any other type of iron or steel which we can find. In field tests this same phenomenon is observed.

I will now refer to experiments on three plates which were exposed to the weather on the roof of one of the buildings of the Institute of Technology at Boston for something over a year. They are all from sheets bought in the open market in Boston; No. 1 is a copper-steel containing 0.22 per cent copper; No. 2 is a pure open hearth iron containing 0.04 per cent copper; No. 3 is a piece of ordinary

The author of this discussion, William H. Walker, is a member of the faculty of Massachusetts Institute of Technology, Boston.

mild steel. The coating on the copper-steel is dense, closely adherent and depolarizes with great difficulty; that on the plain steel is yellow, loose and granular, and allows the surface of the metal to depolarize easily; the pure iron with 0.04 per cent copper is obviously between the two.

Regarding theory, let me say in conclusion that we must remember that the object of science is to make known the phenomena of nature and not to answer the question, "Why they are so"? If we can establish a principle or theory which will corrolate a large number of otherwise unrelated facts, which will help us to explain one phenomenon in terms of another, which will enable us to generalize regarding such phenomenon so as to predict results not yet experimentally established, then theory is a helpful and valuable thing. But on the other hand, if a theory be so used as to obscure a part of the phenomena with which it deals, or if it causes facts inconsistent with it or not explained by it to be ignored, then it becomes harmful, and a hindrance to progress rather than a help to mankind.

Discussion by A. S. Cushman

THE PAPER by Mr. Buck has presented to you one side of a controversy which has been going on in this country for a number of years. Mr. Buck states his opinion that it is unfortunate there should be any difference of opinion on these questions; that there has been an undue adherence of theory without practical demonstration of the value of the theory; that there has been a reprehensible adherence to a particular class of product with which the investigator may be interested financially or otherwise; that too much confidence has been placed in accelerated tests; that the fact has been lost sight of that, even under the best practice, heats below the average are manufactured in all classes of products, with the consequent danger of drawing conclusions from comparing a good heat of one type with a poor heat of another; that it has been customary to draw conclusions from results obtained under peculiar conditions which may or may not be representative. With some of these statements I am in complete accord, but I do not agree that it is unfortunate that these important questions should be debated and that all parties at interest should have a right to analyze and discuss conclusions based upon tests. It is my belief that if these subjects under debate are finally settled the court of last resort must be the unbiased consumer and not the producer of these various types of metal. "Ask the man who owns one" is one of the best commercial slogans. When Mr. Buck selects the word "reprehensible" to characterize partisan zeal he has thrown a boomerang which has a habit of returning to its source.

The testing of sheet metals and wire to determine comparative resistance to corrosion is a complex problem in which many variables, some of them quite unknown to us, may play an important role. In my own experience with corrosion problems which have held my close attention since 1904, I have become convinced that tests, like statistics, can be made to prove almost any thesis which it is desired to prove. The effort to substantiate a point of view may amount to riding one's favorite hobby horse furiously about without realizing or caring that the other fellow's hobby horse also has its backers and admirers. I am not afraid to confess my own proneness to fall into this error, but I have attempted to overcome it, and as the years have gone by I have become more conservative with regard to publishing results of private tests which have not been checked up by engineers representing the great consuming interests. Purely partisan evidence is not convincing, and I think one would be wise to reserve judgment in matters of controversy involving metallurgical conclusions of great moment until the evidence is all in.

If I understand Mr. Buck's purpose in the presentation of his tests, it can be boiled down to very simple language. In short, it is this: We are

The author of this discussion, Dr. A. S. Cushman, is director, Institute of Industrial Research, Washington, D. C.

FIG. 1—WEATHER EXPOSURE TESTS ON FULL SIZE COMMERCIAL SHEETS IN MANUFACTURING DISTRICT

FIG. 2—TEST SHOWING THAT ONLY A FEW 26-GAGE SHEETS HAVE FAILED IN 16 MONTHS' EXPOSURE TO THE ATMOSPHERE OF A MILL TOWN

asked to believe that the accidental occurrence in, or the deliberate addition of 0.20 per cent more or less, of copper to any steel will confer upon it valuable properties in corrosion resistance, to the extent of increasing its period of usefulness many times over. In my opinion, Mr. Buck's tests on which he bases his conclusions are open to criticism both in their conduct as well as in the interpretation of the results obtained. I myself have under supervision quite as extensive and comprehensive tests of full sized sheets, corrugated and plain, which have been exposed for a longer period, and which differ widely both in results and in their interpretation. I have not as yet published these tests for the very reason that I prefer to await the conclusions to be obtained in tests in which the representatives of the consuming interests will have the predominating voice.

Since Mr. Buck has published and republished his own tests and has submitted his conclusions for discussion here, it is no more than just that I should be permitted to analyze his figures and conclusions. In the two tables submitted in this paper, Mr. Buck has fortified his opinions by a group of results showing loss in weight determined on samples 2 x 4 inches in size. I believe such tests to be misleading, since in my opinion it is not the weight lost by a small sample or a number of small samples, but the way a given metal rusts under all possible conditions of service that must inevitably in the end determine the quality of a type. It is not only a possibility, but it is true that a section of metal which is pitting through very rapidly in segregated areas will lose less weight than one that rusts slowly and evenly all over.

Mr. Buck himself has warned us against placing much confidence in accelerated tests, but granting, for the sake of argument, that this method of presenting results has weight, why should not the conclusions have been checked up by independent engineers? The representative of a great consumer, J. L. Campbell, engineer of maintenance of way of a well known railroad, conducted a comprehensive series of tests under varying conditions on a number of different types of iron and steel. The results of these tests can be found published in *Engineering News*, July 30, 1914. The tests were conducted on test pieces 2 inches wide and 2 to 3 inches long. In four of the five series of results published the coppered steels lost more weight per cent in 12 months' exposure than the ordinary non-copper bearing steels with which they were compared. I submit that if Mr. Buck's results are to be taken as final, and if also Mr. Campbell's results are to be accepted, there exists a contradiction here which, before any fair-minded jury, would throw the entire data out of court as being inconclusive and unreliable. If I might be permitted to use my imagination in making an analogy which covers this form of testing and reporting results of tests, it is equivalent to the attempt to determine whether a particular breed or type of dogs is courageous or cowardly by purchasing in the open market a certain number of puppies representing the breed and hanging them up by the tails to determine what percentage of the unfortunate individuals squealed. Upon such data as this learned discussions could be produced as to whether or not that particular breed of dogs was a courageous one. As a matter

FIG. 3—FIRST FAILURE OF 26-GAGE BESSEMER STEEL SHEETS AT END OF 16 MONTHS

of fact, the only way that we can form opinion about such things is by observance of dogs in the long run and by the reputation of the breed which it has made for itself over a long period of years. However, in Table II of Mr. Buck's paper the relative weight losses are not alone depended upon, but are checked up by counting the number of holes which appear after an eight months' exposure of his test pieces at Scottdale, Pa. Now, if Mr. Buck's results as reported in this case can be repeated and checked up by unbiased investigators they would be of some weight, as no one wishes to buy sheet metal which in a thickness of 27 gage is capable of being pierced full of holes or reduced to a condition of open lacework under weather exposure conditions in the remarkably short period of eight months. Such results are astounding to me. I have had, among many others, 26-gage samples of the most ordinary type of non-copper bearing bessemer steel exposed under the atmospheric conditions of a densely populated mill town which has not as yet begun to combat the smoke nuisance, for 16 months before the first hole appeared in any of a large number of full sized corrugated sheets, in spite of the fact that some of my test sheets had been left in the original black, while others for comparative purposes had been first pickled in acid in the usual way. I submit herewith illustrations showing these tests, Figs. 1, 2 and 3.

In order to supplement these atmospheric corrosion tests I adopted the expedient of exposing similar sheets of different types of metal to a more severe test. This was done by bending up the edges of flat non-corrugated sheets so as to make of them shallow pans. These pans were filled with coal slack cinders and exposed in a horizontal position so that the rains could descend upon them. The results are given in the accompanying table. They are no more conclusive than Mr. Buck's tests. This point I wish particularly to emphasize. But it can be reasonably claimed that if the coppered basic steel was the best material amongst the great number of test pieces which I was investigating, they should have confirmed Mr. Buck's results. I give them here for what they are worth, in the belief that when independent engineers have had time and opportunity to thoroughly study these questions they will meet with a great preponderance of similar results.

When as a government official I began the study of corrosion problems in 1904, there was a great complaint in regard to the way that modern steels suffered from rapid corrosion. The past decade has seen progress made in many lines, and the steel industry has not stood still. I call attention to the fact that comparatively speaking the use of the acid-lined converter, both bessemer and open hearth, has decreased, while the growing use of the basic open hearth furnace has led to greater refinement in steel products and, above all, a greater control of the elimination of harmful impurities in many types of metal. I have no hesitation in saying that, led by the extremely pure iron which it is now possible to manufacture in the open hearth furnace, nearly all grades of steel are superior in rust-resisting quality to those which were offered 10 years ago. Products and brands are more standard, or less variable in analysis than they used to be. Also

they are purer with respect to the well known impurities and better degasified, showing that our operating departments are taking more care with the products than was formerly the general rule. I make this statement quite independently of whether the presence of a small fraction of copper in steel is beneficial or whether it is not. To my mind, the great danger in the coppered steel idea is that copper can be used to put the stamp of excellence on a product that may or may not be carefully made. Mr. Buck in his paper sounds the warning that the benefits he claims accrue only if the copper is properly added to molten steel. About 0.2 per cent of benzoate of soda has been used to preserve and make salable very bad tomato catsup, but its presence cannot turn bad and dirty stuff into good and clean food. In my opinion, precisely the same thing is true of 0.2 per cent of copper in steel.

If the tests under my supervision had indicated that copper was beneficial to carefully made pure basic metal, I should have advised the manufacturers of open hearth iron to put the copper in. The fact that it costs in some parts of the world at least more to keep copper out of steel than to put it in shows the easier way. In this respect, it is interesting to quote from J. L. Campbell's paper already cited, who says:

"Perhaps the most significant figures are those showing the relative corrosion of samples Nos. 2, 3 and 4, as they are of the same grade of steel, made by the same manufacturer, and are presumably identical in quality, the difference in copper content excepted. In regard to the addition of the copper, we quote from the letter of the manufacturer, as follows:

"'In regard to the addition of copper, would say that the heats are made up as far as possible with copper scrap and any deficiency in the copper content is made up by adding the requisite amount of metallic copper to the bath in the open hearth furnace about 15 minutes or half an hour before tapping. The copper, therefore, has ample opportunity to become evenly distributed in the steel, particularly by the mixing action which takes place when the steel runs from the furnace into the ladle.'"

I believe that the real reason of any improvement which may have occurred in the effort to introduce copper as a normal constituent of steel lies in the greater purity, better degasification and decreased segregation of the modern material. I feel it necessary as a metallurgist who has given a great many years to the study of the effect of the various impurities as they may or may not influence the resistance to corrosion of a typical metal, to discuss Mr. Buck's statements under his separate headings.

Mr. Buck states that although there has been no attempt made to determine the carbon influence, it seems that in the low ranges present the carbon has little influence and that this is indicated by a study of the tables which he has given with his paper.

As a matter of fact, a great deal of work has been done by a number of metallurgists in this country and in Europe in the study of the effect of carbon on corrosion resistance. Some authorities hold that carbon, inasmuch as it will allow hardening, will act as a protection, provided it is combined with the iron and uniformly distributed. As a matter of fact, however, it rarely is perfectly combined with the iron and uniformly distributed, as the microscope readily shows, and segregation in the cooling of impure molten metal is always an important factor. In our own practice we believe carbon to be deleterious on account of the fact that it is more difficult to properly degasify the metal while carbon is still undergoing oxidation in the process of burning out. I believe that Mr. Buck has followed a good example in limiting his carbon content from 0.02 to 0.14 per cent, with the accent on the minimum side.

Mr. Buck admits that some metallurgists hold the theory that a content of manganese is detrimental to steel in its corrosion resistance, but he does not agree with the theories advanced nor has he observed the slightest evidence or proof that such claims are justified. Nevertheless Mr. Buck acknowledges that manganese combines with sulphur, forming manganese sulphide, which exists in isolated patches but which he holds is at best only a feeble conductor of electricity and as such should stimulate corrosion to only a slight extent, if at all. He says that it is possible that these patches of manganese sulphide when they occur at the surface of the steel, or as they become exposed by the wasting of the steel, may become oxidized.

Now, venturing to differ from Mr. Buck, I submit that in the production of pure iron, the manufacturers do not aim to make material containing patches, and it is this very patchwork condition which existed in the older, segregated, carelessly made steel which has had our most earnest effort in the overcoming. We believe that the consumers of this country are not in favor of patchwork metals, or metals containing patches of ingredients which may contribute to the wasting of the steel to however slight an extent. As a matter of fact, corrosion is governed by a variable number of slight effects, all of which are important. Mr. Buck argues that this patchwork condition is due to the presence of sulphur and not to the presence of manganese. This is an ingenious truism such as the saying that it takes two to make a quarrel. I hold, however, that it is better to use the utmost endeavor to eliminate both the manganese and the sulphur, with the advantage on my side of the argument that it is an easier metallurgical accomplishment to effect the total elimination of manganese than the total elimination of sulphur. But Mr. Buck wants to eliminate sulphur to the highest degree possible, but does not want to eliminate manganese.

In his comprehensive book "The Corrosion of Iron and Steel", Alfred Sang, on page 84, states:

"Dr. Charles B. Dudley (for many years associated with the Pennsylvania railroad) discovered, some years ago, that segregated manganese formed centers of corrosion, and it is a generally accepted fact that steels high in manganese are peculiarly liable to oxidation; if the proportion is small and uniformly distributed the effect is inconsiderable. The effect of manganese is corroborated by many reliable authorities."

Mr. Sang then proceeds to give a list of these authorities. It is true that he points out that if the proportion is small and uniformly distributed the effect is inconsiderable, but Mr. Buck bears witness to the lack of uniform distribution within his range and deliberately admits a condition of isolated patchwork. To my mind no further argument seems necessary.

(*Continued on page* 1165.)

Cinder Pan Corrosion Test

Sheet No.	Material.	S	P	C	Mn	Cu	Ni	Condition after 9 months
85	Bessemer steel	0.038	0.094	0.012	0.36	0.016	....	15 holes
108	Basic copper steel.....	0.028	0.008	0.10	0.19	0.26	....	6 holes
169	Pure basic O. H. iron...	0.020	0.004	0.012	0.008	0.032	....	sound
123	Pure basic O. H. iron...	0.029	0.006	0.012	0.023	0.024	....	1 hole
127	O. H. nickel alloy.....	0.020	0.007	0.010	0.037	0.036	0.16	5 holes
126	O. H. copper nickel alloy	0.019	0.009	0.010	0.015	0.23	0.26	6 holes
170	O. H. copper nickel alloy	0.027	0.006	0.010	*	0.17	0.20	sound
121	O. H. high nickel alloy..	0.024	0.004	0.010	0.015	0.028	1.00	sound

*Trace.

A BIRD'S EYE VIEW OF MORGAN PARK, A MODEL TOWN

Morgan Park is being built to house the employes of the new plant of the Minnesota Steel Co. About 170 houses containing 350 apartments Morgan Park will contain the Minnesota Steel Co.'s offices, check house, hospital, etc. A combination grade and high school

Carbon-Vanadium Forging Steel

IT IS generally conceded that steel of great strength is needed for locomotive axles and forgings, particularly for the modern heavy road engines. To meet this requirement, the railroads have turned to heat-treated carbon and heat-treated alloy steels, notably chrome-vanadium steel. It is the concensus of opinion of many that it is desirable to obtain a steel of moderate cost that without heat-treatment other than annealing to refine and toughen the grain, will have physical properties approximately equal to those specified for heat-treated carbon steel forgings. With the great reduction in the cost of vanadium that has taken place during the last year, the American Vanadium Co., Pittsburgh, resumed the investigation and study of the application of vanadium to simple carbon forging steels, which was dropped about 12 years ago on account of the high price of vanadium. At that time some tests were made on the effect of vanadium in simple carbon steels and a very considerable increase in strength was found to result. The effect of vanadium on alloy steels such as chrome steels was however so very much greater that development naturally proceeded with the alloy steels rather than the simple carbon steels even at the higher price of the former. As a result of the latest investigations, the American Vanadium Co. has developed a type of simple carbon-vanadium steel which without heat-treatment other than simple annealing is said to equal all requirements specified for heat-treated simple carbon steel forgings of like sections. Furthermore, these results are obtained from steel with lower carbon than is generally used to obtain the physical requirements for heat-treated carbon steel locomotive axles and forgings. Through the elimination of other alloys than vanadium, the cost of this steel is only a little higher than simple carbon steel.

In the accompanying table are given results of tests on axles and connecting rod forgings from this new type of steel. The analysis of this steel is as follows: Carbon, 0.47 per cent; manganese, 0.90 per cent; phosphorus, 0.012 per cent; sulphur, 0.020 per cent, and vanadium, 0.15 per cent.

In annealing such pieces as locomotive forgings, the object should be to remove existing coarseness of grain; increase the toughness and maintain as high an elastic limit and tensile strength as possible. The method of annealing recommended to attain this object most completely is to heat the forgings uniformly at a temperature of 1,425 degrees to 1,475 degrees Fahr.; then remove from the furnace and allow to cool in air, protected from strong drafts and rain or snow.

The tendency of vanadium is to increase the elastic limit and strength of the steel without lowering the ductility. Vanadium also has a very strong influence chemically and physically through its combination with carbon in retarding segregation. Vanadium steels are all said to be remarkably responsive to heat-treatment, and this simple carbon-vanadium steel is no exception.

Where still higher results are desired than can be obtained by the simple annealing, heat treatment is recommended. In such a case heat the forgings uniformly to about 1,600 degrees Fahr., and quench in oil. In case water is preferred as a quenching medium, the temperature should be about 1,550 degrees. The forging should then be drawn back or tempered by heating to a temperature of 1,100 degrees to 1,150 degrees Fahr.

Tests of Simple Carbon-Vanadium Steel

Description.	Treatment.	Yield point, lbs. per sq. in.	Elastic limit, lbs. per sq. in.	Ultimate strength, lbs. per sq. in.	Elongation in 2 in., per cent.	Reduction of area, per cent.
7 in. axle	Natural	71,200	68,000	123,000	16.0	30.0
7 in. axle	Annealed 1,450 deg. Fahr.	56,000	52,000	90,000	24.0	50.0
7 in. axle	O. Q. 1,600; T.1,160 deg. Fahr.	85,000	82,000	112,500	22.0	55.0
11 in. axle	Natural	75,000	70,000	117,000	16.0	28.5
11 in. axle	Annealed 1,450 deg. Fahr.	58,000	54,000	94,000	22.0	47.0
11 in. axle	O. Q. 1,600; T.1,160 deg. Fahr.	87,000	80,000	115,000	20.5	52.0
Con. rod	Natural	92,000	85,000	131,000	17.0	44.0
Con. rod	Annealed 1,450 deg. Fahr.	71,500	67,000	105,000	23.5	52.0
Con. rod	O. Q. 1,600; T.1,160 deg. Fahr.	92,500	86,000	123,000	20.5	50.0

O. Q. = Oil Quenched. T = Tempered.

BUILT BY THE STEEL CORPORATION NEAR DULUTH, MINN.

have been erected. The houses are of concrete construction and a special effort has been made to vary their appearance, so as to avoid monotony. building, specially arranged for vocational training will be constructed, together with stores and other conveniences.

Corrosion Discussion

(*Continued from page* 1163.)

With regard to Mr. Buck's opinion about the influence of sulphur, I am glad to say that I find myself for once in complete agreement with him, and feel no doubt that in his laudable drive against sulphur in the products under his charge he has been working in the right direction. With regard to phosphorus, there is little accurate data as to its effect upon resistance to corrosion. I myself in a paper delivered before this institute some years ago pointed out that nearly all the ancient irons which represent the survival of the fittest were remarkably pure with respect to every element with the single exception of phosphorus. However, I do not feel that any beneficial effect that it might possibly have has yet been proved in modern practice.

Mr. Buck claims that silicon present in the amount of 0.15 per cent and 0.30 per cent leads to a distinctly increased rate of corrosion. I am not prepared to question the accuracy of this statement; it is in effect but one more argument for purity.

Mr. Buck states that it is quite generally conceded if copper is properly added to molten steel to the amount of approximately 0.25 per cent the life of the steel under atmospheric conditions is greatly increased. This is, of course, on its face, an incorrect statement. I for one do not concede it, and there are a great many investigators who have published their work in the technical press of the world who agree with me. In addition to this there is a great body of perfectly unbiased investigators who feel that the point has not yet been proved one way or the other. I do not hesitate to state that no such claim is justified on any basis of unbiased evidence. Mr. Buck says: "We have reached this conclusion from observations of copper-bearing steels after several years' exposure." I may reply to this that we have reached quite the opposite conclusion and that we believe any improvement noted by Mr. Buck is due to a better degasification and less segregation than in the ordinary steels which he has been using for comparative purposes.

Character of the Rust

The statement that the rust formed on copper-bearing steel is dark brown, closely adherent and smooth, is only partially true. I have noted a number of test samples of copper-bearing steel which showed just such an excellent condition as Mr. Buck refers to, but on the other hand I have seen a great number of specimens of copper-bearing steel, especially those made in the acid processes, which show the limonite red, rough, loose and spongy character of rust to which Mr. Buck refers. Almost invariably the open hearth irons as free as it is possible to get them from copper show the dark brown, closely adherent, smooth surface which seems to be characteristic of all properly degasified basic open hearth metal. As a result of my observations of numerous tests extending over a great number of years I must emphatically disagree with the statement put forth by Mr. Buck covering this particular point. Mr. Buck has stated that it is his belief that since copper is electro-negative to iron when it is properly mixed and incorporated with it, it reduces the tendency to corrosion by lowering the difference of potential between the metal and the loosely adherent rust or oxide. If this is true, why, may I ask, does not silicon also in the amounts of from 0.15 to 0.30 per cent, show a similar effect, since silicon is also a strongly electro-negative element? But as a matter of fact, as Mr. Buck claims, the addition of silicon in this range increases the tendency to corrosion. Such metallurgical arguments as these advanced by Mr. Buck cannot be accepted on their face, and when Mr. Buck sums up that the beneficial influence of copper in steel and iron is most marked under atmospheric conditions as well as under soil, water and other natural conditions, I must claim my right to utterly disagree with him not only from the standpoint of the theories he has advanced, but also as the result of close application to the study of numerous carefully planned tests extending over a number of years.

I submit that, in spite of the fact that we are all forced into undertaking weather exposure tests of uncoated sheet metals, such tests are irrational, inasmuch as no one yet uses any kind of iron or steel in an uncoated or unprotected condition, except in a few rare instances in which the conditions of service do not permit of protective coatings. If we are to make such irrational tests, however, I submit that the test pieces should not be pickled or sand-blasted or otherwise treated by special annealing or cold rolling, or by any other method, but should go on test as nearly as possible in the condition that a prospective customer would be likely to buy similar sheets. If any other method than this simplest one is followed, a string of variables is introduced that could easily keep many of us so-called experts and our descendants arguing over the results until the crack of doom.

I submit also that 26 and 27-gage

(*Continued on page* 1228*b*)

Unusual Welding Job

One of the largest oxy-acetylene cast iron welding jobs ever attempted was recently completed at the plant of the Oxweld Acetylene Co., Chicago. The casting, a spider for a gyratory stone crusher, weighed 40 tons and required a flat car to carry it. It was cracked and broken at the hub in such a manner as to render it useless. A new casting would have cost $2,300 without considering the loss of time. The segment of the rim not shown in the illustration was uninjured and therefore was not shipped to the welding plant. The damaged portion weighed 60,000 pounds and the uninjured segment weighed 20,000 pounds.

After the crack and break were properly chipped out, the opening was so large that more than 900 pounds of new material were added during the welding operation. The welding was done continuously with two shifts of men and 60 hours elapsed before the job was completed. The welding was performed while the hub was buried in a charcoal fire which heated the affected part to the proper temperature to take care of internal expansion and contraction strains. The charcoal fire was confined in a temporary brick furnace about 7 feet square and 4½ feet in height, which was built around the casting. After the weld was finished, the work was covered with sheet asbestos and was allowed to cool off gradually.

BROKEN CRUSHER SPIDER WELDED BY THE OXY-ACETYLENE PROCESS

Braeburn Booklet

The Braeburn Steel Co., Braeburn, Pa., has issued a 30-page catalog, describing and illustrating the products of its tool steel mill. The first few pages of the booklet are devoted to a brief history of the company, which was founded in 1897 by William Metcalf. Various products of the plant are described briefly and classifications and price extras are offered. Several valuable tables for computing the weight of cast steel and instructions for working high speed tool steels also are provided.

Motor-Driven Power Hammer

Beaudry & Co., Inc., Boston, recently have designed the motor-driven power hammer shown in Fig. 1. For this service, a motor of not more than 900 revolutions per minute is used, equipped with belt tightener attachment. To obtain this drive, the company designed and brought out the friction clutch shown in Fig. 2.

This clutch comprises the following parts: Pulley, ring, brake section, cam, lever, expansion pin, roll and washer. The ring is split to fit the head of the expansion pin, the slot in the ring having steel faces. The brake section is keyed to the shaft. The pulley runs loose on the hub of the brake and is lubricated through a grease cup. The cam is spiral and is held in a neutral position by a spring on the frame. A steel roll fits into a slot in the lever. The expansion pin is fitted with adjusting screws and check nuts permitting adjustments by removing the washer and sliding back the pulley.

The operator is said to have the hammer under exact control, according to the pressure exerted on the treadle.

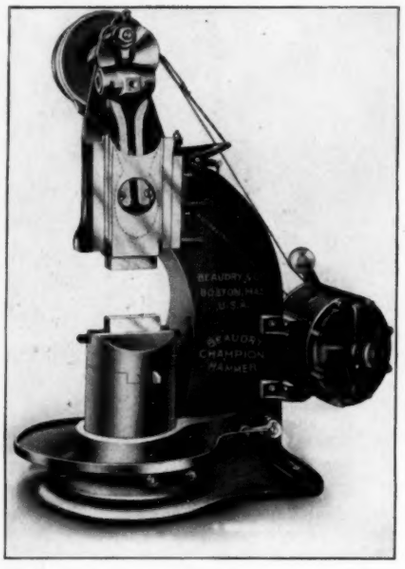


FIG. 1—POWER HAMMER EQUIPPED FOR MOTOR DRIVE

The blow struck by the hammer is directly proportional to the pressure exerted. The brake is automatically released when the hammer is in motion.

"Organization of Workshops and Factories" is the title of a booklet recently issued by Dr. Robert Grimshaw, New York University, New York City. The booklet embodies some of the material used by Dr. Grimshaw in a course of lectures on cost reduction given at New York University and also at the School of Science and Technology, Pratt Institute, Brooklyn, N. Y.

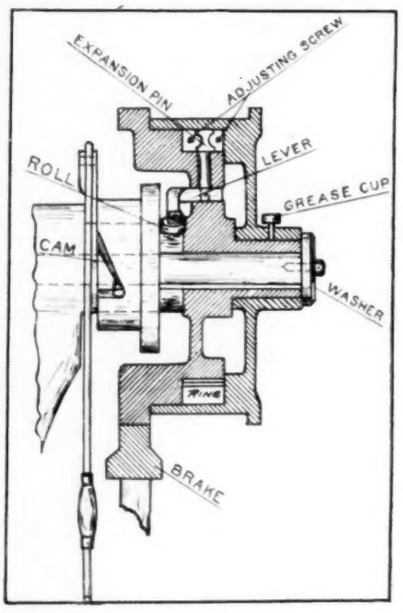


FIG. 2—NEW DESIGN OF FRICTION CLUTCH

Progress in Blast Furnace Practice

A Study of the Accessories of a Stack and the Changes Effected by Modern Operators—Development of Furnace Lines

BY A. E. MACCOUN

In the second installment of his article on "Progress in Blast Furnace Practice," Mr. Maccoun discusses the modern trend in the construction of a furnace and its appurtenances. He points out the economies effected by changes in design and by improvements in handling facilities. The relation of blast furnace lines to operating conditions is pointed out. This study is of great importance and the reader who is anxious to follow it further, will be interested in the articles on "American Blast Furnace Practice," by Hermann A. Brassert, published in The Iron Trade Review, May 28, June 4 and 11, 1914.

A GREAT amount of study has been expended on blast furnace construction, not only in improving the quality of the product and reducing the operating expenses and cost of production as much as possible, but in an endeavor to make this class of work safer and more pleasant for the men employed.

To secure the most regular working in the furnace the materials should be as uniform as possible in composition. With the ores used, this is done before shipment by a very thorough system of mixing the ores from the mines so that the resultant material shows only slight variations during the entire season. The various cargoes of each particular ore further undergo an additional mixing as they are unloaded into the furnace stock piles by the ore bridges, so that any portion of the pile may be considered representative of the season's average ore shipments. This system results in the elimination of one of the variable conditions confronting the furnace man, due to irregular analysis of ore, and helps greatly in attaining uniform operation.

In order to aid still further in obtaining a more uniform mixture, both chemically and physically, bin systems of the most improved type are being adopted for ore, coke and limestone.

The importance of many of these refinements necessarily has come from having to use percentages of Mesabi ores in our burdens. Mesabi ores being very easy to reduce, it follows that when carrying a large percentage of these fine ores, the greatest care must be given to distribute them to the best advantage in a furnace burden. Owing to the tendency of the Mesabi ores to pack closely, the ascending gases do not percolate through the burden readily and try to find the easiest passages. When this occurs, the ascending gases do not come in contact with the ores evenly over the whole surface included across the horizontal sections of the furnace, and some of the ores will not be thoroughly reduced by the gases. This will cause an increased coke consumption on account of the carbon necessary to reduce this ore, which requires partial direct reduction.

These difficulties are also augmented by any irregularities in charging or the arrival of large quantities of material in a state of fine mechanical division, giving rise to an interruption in the uniform upward flow of the gases. This is one of the important reasons why soft coke, coke dust, limestone dust, etc., should be thoroughly eliminated.

Methods for unloading ore in bins and stock piles have been greatly improved upon in recent years, effecting a reduction in operating cost and eliminating severe hand labor. This is accomplished at inland furnaces by car dumpers, ore bridges and systems of automatic dump motor-driven transfer cars carrying ore to stock piles or furnace bins. At lake furnaces, unloaders in connection with ore bridges are used

Second installment of a paper read at the New York meeting of the American Iron and Steel Institute, May 28. The author, A. E. Maccoun, is superintendent, Edgar Thomson furnaces, Carnegie Steel Co.

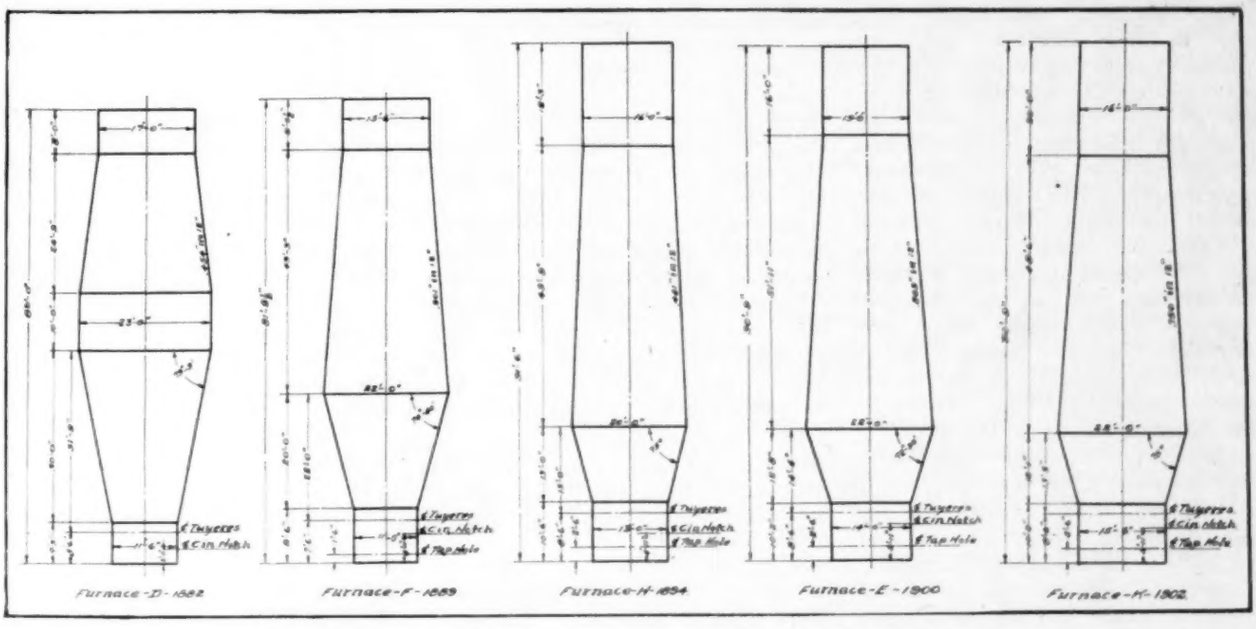


FIG. 1—DEVELOPMENT OF FURNACE LINES AT EDGAR THOMSON WORKS, 1882-1902

in transferring ore from vessels to stock piles and furnace bins.

The modern bins are of very large capacity. This insures better mixing and plenty of materials on hand in case of temporary shortage in the supply. An added advantage is found in not requiring an unloading force on the trestle during the night shifts.

There should be at least two, preferably three, unloading tracks over the top of the bins, one track being used for transfer car service. The bins should be arranged in sections of suitable length for dumping cars, and designed to avoid any tendency of the coarse and fine materials to segregate in the bin itself, or in drawing the stock from the bin chutes into larry cars.

Large capacity larry cars are used between bins and skips with recording scales to obtain accurate weighing. Greater uniformity and economy in both labor and power is obtained with the large size larry, on account of the fewer number of trips required. In some cases, a modern larry car will hold a full charge of ore and limestone. Furnace shells of heavy riveted steel plate construction are being used. Downcomers and dust catchers are being greatly increased in strength. Linings are laid directly against the shell and no packing space is used, as formerly, to take care of the expansion of the brickwork. Hearth and bosh construction have been greatly strengthened and improved upon. Substantial hearth jackets of greatly increased strength are being used. They are strong enough to resist expansion of the brickwork, are absolutely tight and thoroughly water cooled. As a result the danger of severe breakouts is practically eliminated. Ditches around hearth jackets have been found objectionable. The usual bosh preferred for large Mesabi furnaces is protected by bronze cooling plates and is heavily banded to supply the necessary strength. An over-cooled bosh is very objectionable and is often responsible for poor furnace practice. Bosh angles have become steeper and shorter, making a quicker descent for the charge. Distances of tuyeres above cinder notch have been increased slightly with encouraging results.

Protection for the inwall of a furnace by cooling plates has shown itself to be very beneficial in many cases. Furnace "I" of the Edgar Thomson furnaces, which was protected in this manner, produced 1,200,000 tons on the last lining. The claim is not made that these plates hold the furnace lines absolutely, nor is it believed that this is desirable in some cases. It is claimed, however, that this cooling helps to extract some of the heat from the inwall, increasing its resisting qualities to heat and to erosion by the gases. The batter of furnace stacks has been increased, and is now preferably as near 1 inch to a foot as possible.

Studies have been made of the quality of fire brick best suited for furnace linings, their resistance to erosion by the furnace gases, and abrasion by the stock. In this connection porosity, density, melting point, conductivity, abrasion and spalling tests have been made, and the effects of various percentages of calcined flint, flint and plastic clays studied, together with the influence of the weathering, grinding and coarseness of material in relation to the above qualities.

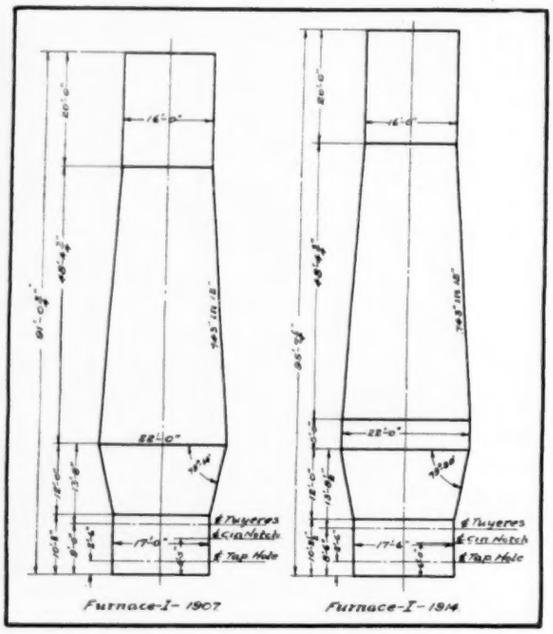


FIG. 2—DEVELOPMENT OF FURNACE LINES, 1907-1914

Stock line protection is being secured by the use of numerous arrangements which are giving excellent satisfaction.

Bells and hoppers are now designed that give no trouble during the campaign of a furnace. Large bells of from 12 feet to 13 feet diameter, 50 to 55 degrees angle, are preferred, on stock lines for 16 to 17 feet. The steeper angle helps to prevent ore accumulating on their surface and injuring the distribution. In some cases, good results are obtained with a 9 foot 6 inch, 50 to 55 degree angle bell, and an 11 foot 6 inch distributor. These sizes are subject to slight variation on different classes of raw materials, and it is often necessary to try them out to find which arrangement best suits furnace conditions, depending on the ability of the furnace to keep itself clean and work regularly. The size and length of the tuyeres best suited to the conditions also must be determined.

Distributors, receiving hoppers, and furnace tops are of many types, all of which endeavor to perfect the distribution of stock entering the furnace stack, and either eliminate or compensate for as many irregularities as possible. It is always important to get the stock distributed as evenly as possible around the circumference of the large bell before dumping into the furnace, taking into consideration not only the quantity of materials, but the proportion of coarse and fine. The simplest furnace top that will give good results is always the best, as too much mechanism to look after on the top of a blast furnace is objectionable. Vertical up-takes are taken off the furnace shell as high above stock line as possible, preferably at four points equally spaced on the circumference. Safety explosion doors to allow relief on slips, but which do not allow a large amount of material to be thrown out of the furnace, should be placed on top of the up-takes. Downcomer connections are taken off of the up-takes to reduce flue dust and return as much material as possible to the furnace on slips. It is important to have these gas openings of sufficient area to keep down the velocity and to prevent too much back pressure on the furnace. These off-takes are usually arranged so that they are not directly over the tapping hole, cinder notch, or entrance of the blast main to the bustle pipe, as a furnace is always more active at these points, and this helps to prevent channeling and gives a more even distribution of the gases in their ascent through the stock.

In 1911, it was proposed to plug the tapping hole with the blast on the furnace. The Carnegie Steel Co. was the first to successfully apply a modified form of a clay gun for this purpose, and at present, several are in use on its furnaces.

The gun is swung into position mechanically, so that no men are necessary near the tapping hole, until it receives the first barrel of clay from the gun, which is generally all that is required to plug it. If necessary, the gun can be operated manually, until

sufficient clay has been put into the hole.

The advantages gained by this method are: (1) Safety; (2) more regular working furnace, as the stock in the bosh does not settle and pack to the same extent as when the blast is taken off; (3) increased production; (4) when tuyeres are working wet after casts, the hole can be plugged without cinder running back and filling blow pipe.

The same company is also using a modern cinder notch botter on some of the furnaces. This consists of a botting bar suspended over the cinder notch, and arranged to move in a guide in a vertical plane, so that it can be operated by a man at one side of the cinder notch. This eliminates the danger of a man being burned with splashing cinder, which is the case in the old method of botting with a straight botting bar with a man standing directly in front of the notch.

Considerable savings are made in arrangements of cast houses and the use of large iron ladles, to reduce scrap. Economies also are made by the use of air dump cinder ladles. Further savings are effected by the use of modern machinery for unloading miscellaneous materials, such as coke dust, loam and clay, around blast furnaces.

Necessarily these important points have been only briefly mentioned. Each one in itself is a very important study, and of great interest to a blast furnace manager.

A great amount of thought and study has been given by the Carnegie Steel Co. to the lines of blast furnaces since the early days of the Edgar Thomson furnaces. This plant was one of the pioneers in advancement in this direction, having under consideration the design of lines as affected by the degree of hot blast materials of burden and slag composition, effect on the fire of the lining, uniformity of product, freedom from high pressures, scaffolding and hanging, and the interdependence of furnace lines and the size of bells and tuyeres and the blast pressure.

Mr. Brassert at the meeting of the American Iron and Steel Institute, May 22, 1914, read a very valuable paper in which the history of the development of the Edgar Thomson furnace lines was given, stopping with furnace "K", built in 1902. In Figs. 1 and 2 is shown the development up to the present time of the lines of the Edgar Thomson furnaces. It will be noticed that furnace "I", having a 17-foot hearth, 78-degree 14-foot bosh angle, 16-foot line, and 22-foot bosh, was started in March, 1907. With this furnace, it was demonstrated that a steep bosh resulted in increased uniformity in the descent of the charge to the hearth. The short bosh also reduced the tendency to hanging. December, 1908, Mr. Brassert followed with South Chicago furnace No. 7, with the 17-foot hearth and 78-degree angle. Furnace "I" had a very remarkable blast record on her last lining. It was the first bessemer or basic furnace, at the Edgar Thomson works, with a partially protected inwall. It was blown out April, 1914, because of the depressed condition of the iron market at that time, having produced 1,200,000 tons. Fig. 3 shows the lines of this furnace and the arrangement of the bosh cooling plates that were used. A view of the proposed lines for furnace "I", with a 17-foot 6-inch hearth, 22-foot bosh, 70-degree 20-foot bosh angle, 95-foot height, and 16-foot stock line is shown in Fig. 2. A slightly improved coke consumption from the increased height of five feet is expected as data from other furnace plans of this height seem to prove that it will be of slight advantage.

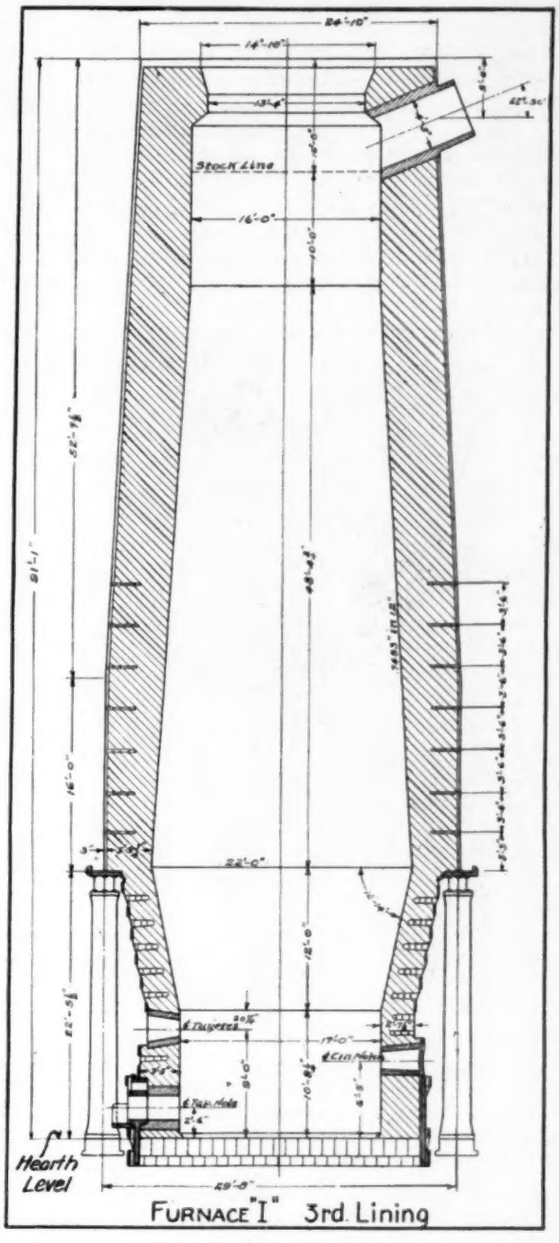


FIG. 3—LINES OF MODERN FURNACE, AND ARRANGEMENT BOSH COOLING PLATES

(To be continued.)

Apprentice School

By A. W. Soderberg

The educational work carried on at the Homestead works of the Carnegie Steel Co., Pittsburgh, applies not only to the employes, but to the whole community. A large part of the welfare work can easily be classed as educational, especially the play grounds where the children are taught systematic play. At the Homestead Carnegie library there are four departments—library proper, music hall, club and gymnasium, and the educational department. The latter has classes in mechanical drawing, metallurgy and most of the branches taught in the public schools. The company also conducts a course for salesmen, a post-graduate course and a school for apprentices. This paper will deal with the mechanical drawing class of the library and the steel works' apprentice school. The library mechanical drawing class was organized in 1900 and is open to the general public for a small membership fee. The term begins Oct. 1 and ends April 1. The course is three years. There are two sessions, of two hours each, per week. As an inducement for completing the course, students are awarded a certificate of honor if they attend 75

A paper read at the monthly meeting of the Association of Iron and Steel Electrical Engineers, at Pittsburgh, April 10. The author, A. W. Soderberg, is assistant mechanical engineer, Homestead, Pa., works, Carnegie Steel Co.

per cent of the sessions and do satisfactory work. The membership of this class is made up principally of mechanics from the mills and some boys from the local high schools.

The course is made as practical as possible on account of the number of mechanics attending, who realize the necessity of being able to read and make an ordinary working drawing. With this in view, the student is taught to make sketches from models and a finished drawing from his own sketch. This system is more practical and nets better results than by working from flat copies.

This class at present has an enrollment of about 50. Since its establishment over 550 men and boys have taken advantage of the opportunities offered. The effects are far reaching, both to the individual and the industries.

The Apprentice School

The apprentice school for boys was put in operation in November, 1913, largely through the efforts of John McLeod, assistant to the president of the Carnegie Steel Co. and vice president of the National Association of Corporation Schools. There are at the present time 56 boys in the school. To be admitted to the apprentice course, the applicant must be not less than 16 years of age, and must have completed the seventh grade in the public or parochial schools or the equivalent. He is also required to undergo a test in arithmetic, which is not very severe. A system is being considered by which a boy's fitness for the trade which he wishes to learn can be ascertained. The course is of four years' duration. The students spend two sessions, of one hour and 45 minutes each, per week in the class room, a total of 728 hours during the four years. Converted into six-hour school days, this is equivalent to six months of schooling.

In laying out the course of instruction for the school, the first aim has been to make efficient mechanics for the Homestead steel works and to utilize the limited time to the very best advantage. Each apprentice spends one session a week on the drawing board and the other session in the class room on practical problems pertaining to shop work.

The school is divided into two divisions. All beginners are required to spend a year in the first division, reviewing the mathematics secured in the public schools. They are taught to apply this knowledge to practical problems. After completing the first year's work, the student is transferred to the other division. The work there includes hydraulics, steam, power stations, machine shops, open hearth practice, blooming mills, structural mills, plate mills and blast furnaces. The student is admitted to this class at any time, as eventually he will take up the subjects studied previous to his entering.

The part of the course covering steam has been taken up recently. Prior to the work in the class room, the boys were taken to one of the boiler plants in the mill, where the functions of the water purifying system, feed water heaters, pumps, water and steam mains, stokers, boilers, coal and ash-handling machinery were explained to them by an expert. During these trips, the apprentices are required to take notes.

Some of the boys have gone to work because they wanted to leave

FIG. 1—FILTERING UNIT WITH BAG PARTLY REMOVED

school. Now that they are working, they have found to their disappointment that they still have to go to school. A small minority think they are born mechanics and know it all. It has been very encouraging to find that the great majority of boys from the very beginning take hold with a will. By the interest shown and the work accomplished, it has been demonstrated that the school is bound to prove a paying investment both to the employer and employe.

One of the important factors in a school of this kind is to have instructors who are thoroughly in sympathy with the work and can apply theory to practice, so that the student can grasp and remember what he is taught. These men should be familiar with the mills. They should be able to arouse interest and enthusiasm in the work.

New Oil Filter

An oil filter for power plants has been developed recently by the Richardson-Phenix Co., Milwaukee, Wis. Tests on a Richardson filter, which were conducted at the power plant of the Hotel McAlpine, New York City, were described in *The Iron Trade Review*, July 2, 1914.

In operation, the filter receives the incoming dirty oil, which is heated to lower its viscosity, thus reducing its ability to retain water and solid particles in suspension. The oil is then led at a low velocity over shallow trays where precipitation takes place. The fluid then flows through the filtering medium and is stored in the clean oil compartment ready for reuse. If necessary, the oil is passed over cooling coils before being returned to the filtering system.

The water which is separated from the oil collects in the bottom of the trays, and after being led to the precipitation compartment is automatically ejected by a water overflow tube consisting of two concentric pipes. The water flows upward through the outer pipe and spills over the top of a funnel. The funnel is threaded and can be raised or lowered, providing proper adjustment for oils of different specific gravities.

Non-Collapsible Units

In the filtering compartment are nine non-collapsible units of the type shown in Fig. 1. The oil passes from the outside to the inside of these units and then through nozzles, which project through the wall of the filtering compartment to the clean oil chamber. The nozzles on each unit fit into a spring-actuated valve, so that any unit can be withdrawn and cleaned without interfering with the continuous operation of the filter. When the unit is withdrawn, the valve closes and prevents unfiltered oil from entering the clean oil compartment.

The head of oil over the filtering discs is shown by the indicators on the front of the filter. When operating normally, this gage shows a level of three inches. When the filter is not operating properly and the cloths need cleaning, a greater height is indicated as the oil does not pass through the cloths as rapidly.

The filter body is constructed of galvanized sheets reinforced with channel and angle iron. All joints are lapped.

The unit shown in Fig. 1 is installed in a filter with a capacity of from 200 to 400 gallons per hour. Filters having a capacity of 7,500 gallons per hour in a single unit have been installed.

Judge Praises Steel Corporation

Commending Its Broad and Generous Policy

Traces the Evolution of the Great Iron and Steel Industry—Declares That Integration Was Necessary and Far Sighted—Criticises the Price Maintenance Policy

THE decision, in full, written by Judge Buffington, in the suit against the United States Steel Corporation, is as follows:

IN THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF NEW JERSEY

UNITED STATES OF AMERICA

vs.

UNITED STATES STEEL CORPORATION and others.

Before Buffington, Hunt, McPherson, and Woolley, Circuit Judges.

BUFFINGTON, J.

We may say in advance that all the members of this court are in agreement as to the decree that will be entered in this case, although we are not in complete accord concerning every step by which that result is reached.

The subject matter of the litigation is of such magnitude and complexity and the record is of such size that the effort to set bounds to this discussion has not been easy. So many questions, large or small, were laid before us in the oral argument, and so many are considered in the extended briefs of counsel, that we cannot hope to give them all a place in such discussion. But we trust that one or other of the two following opinions will pay adequate attention to the most important, with the result of avoiding repetition as far as possible while presenting somewhat different aspects of the controlling principles by which the case must be decided. Without a needless expansion of the discussion, it would scarcely be practicable to take up each detail for the purpose of pointing out just where we are in complete agreement, and where certain divergencies of view exist. We have thought it best, therefore, to adopt the course referred to, believing that the two opinions will cover the whole case, and will also sufficiently indicate the reasons that have led us to a common conclusion.

Case of Business Facts

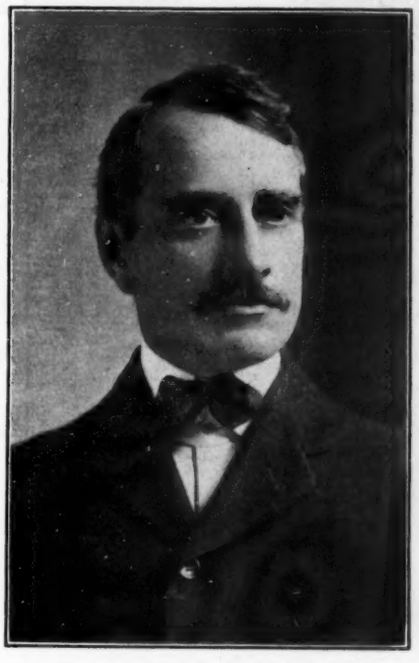
This case—a proceeding under the Sherman anti-trust law—is largely one of business facts. The construction of that statute has been settled by the Supreme Court: Standard Oil Co. v. United States, 221 U. S. 1; United States v. American Tobacco Co., 221 U. S. 106. That construction was applied in this circuit in the Keystone Watch case, 218 Fed. Rep. 502, and the Powder Trust case, 188 Fed. Rep. 127. It follows, therefore, that our duty is largely one of finding the facts and to those applying settled law. The act in question provides:

Sec. 1. Every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several states, or with foreign nations, is hereby declared to be illegal. Every person who shall make any such contract or engage in any such combination or conspiracy, shall be deemed guilty of a misdemeanor, and, on conviction thereof, shall be punished by fine not exceeding $5,000, or by imprisonment not exceeding one year, or by both said punishments, in the discretion of the court.

Sec. 2. Every person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce among the several states, or with foreign nations, shall be deemed guilty of a misdemeanor, and, on conviction thereof, shall be punished by fine not exceeding $5,000, or by imprisonment not exceeding one year, or by both said punishments, in the discretion of the court.

Sec. 4. The several circuit courts of the United States are hereby invested with jurisdiction to prevent and restrain violations of this act; and it shall be the duty of the several district attorneys of the United States, in their respective districts, under the direction of the attorney general, to institute proceedings in equity to prevent and restrain such violations. Such proceedings may be by way of petition setting forth the case and praying that such violation shall be enjoined or otherwise prohibited. When the parties complained of shall have been duly notified of such petition the court shall proceed, as soon as may be, to the hearing and determination of the case; and pending such petition and before final decree, the court may at any time make such temporary restraining order or prohibition as shall be deemed just in the premises.

Sec. 7. Any person who shall be injured in his business or property by any other person or corporation by reason of anything forbidden or declared to be unlawful by this act, may sue therefor in any circuit court of the United States in the district in which the defendant resides or is found, without respect to the amount in controversy, and shall recover three-fold the damages by him sustained, and the costs of suit, including a reasonable attorney's fee.



JUDGE JOSEPH BUFFINGTON

It was most fitting that the principal opinion in the United States Steel Corporation suit should have been prepared by Judge Joseph Buffington. Born in Kittanning, Pa., Sept. 5, 1855, and admitted to the bar in 1878, he practiced law in that town until 1892, when he was appointed United States district judge for western Pennsylvania. In 1896 he was appointed judge of the United States circuit court, and in 1906 was advanced to the bench of the United States circuit court of appeals, and during his long service he presided over many important cases affecting the iron and steel industry. He was practically reared in the atmosphere of the iron and steel business, and his intensely interesting and able decision shows that the hand that prepared the material was guided by a mind which had a good working knowledge of the business. That the decision was such an intelligent, well prepared ruling was to be expected with men of the standing of Judge Buffington on the bench. His decisions are always looked upon as high grade products of the legal art.

Not to Fetter, but Foster Trade

When the constitution of the United States conferred on congress the right "to regulate commerce with foreign nations and among the several states", its purpose was not to fetter, but to further and foster trade. This constitutional purpose to promote lawful trade by protecting it from unlawful restraint is avowed in the title of the act, viz.: "An act to *protect* trade and commerce *against* unlawful restraints and monopolies", and, as held by the Supreme Court, Standard Oil case, supra, "one of the fundamental purposes of the statute is to protect, not to destroy, rights of property".

Now unlawful restraints of trade are of three kinds, past, present and future. As to present and future restraints, congress, by Sec. 3, empowered "the attorney general to institute proceedings in equity to prevent and restrain such violations", and to that end invested the courts "with jurisdiction to prevent and restrain violations of this act". The jurisdiction here

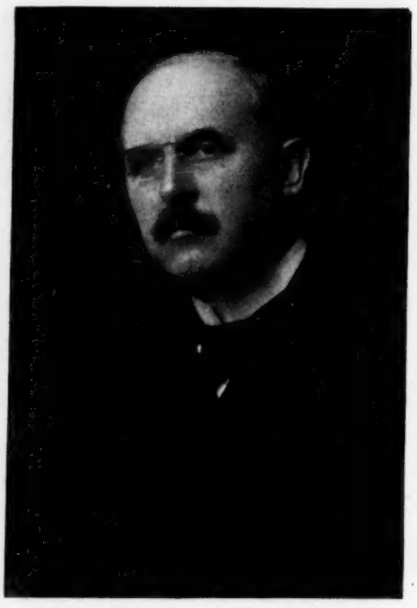
conferred is the chancery power of injunction, a power which is used to restrain present wrongs or prevent threatened ones. This is shown by the act providing even for temporary preliminary restraining orders while the case is being heard. "The function of an injunction is to afford preventive relief, not to redress alleged wrongs which have been committed already", Lacassagne v. Chapin, 144 U. S. 124, cited in Black v. Jackson, 177 U. S. 360. Applying that general principle, the Supreme Court of the United States, in the Standard Oil case, supra, citing Swift v. United States, 196 U. S. 375, said on page 77: "It may be conceded that ordinarily where it was found that acts had been done in violation of the statute, adequate measure of relief would result from restraining the doing of such acts in the future." In view of what was held by this court in the Powder case, supra, it scarcely need be again said by us that where the evil effects of past undue restraint or monopoly continue to be effective and harmful when the proceeding is begun, that is, where "the inherent nature of the contemplated acts" is such as to bring about their continuance and repetition, or where, to use the expressive language of the Supreme Court in the Standard Oil case, 221 U. S. 75, a "perennial violation" of the act exists, the jurisdiction to restrain present and prevent future violations vests under this section, and if, to prevent continuance of such continuing wrongs a dissolution of the unlawful combination is necessary to make the relief effective, the original combination will be dissolved. That power was exercised by this court in the Powder case supra, and by the Supreme Court in the Standard Oil case, supra, and the Tobacco case, supra. In the Keystone Watch case, supra, this power to dissolve was not exercised, the court there saying:

> But we see no sufficient evidence that the public interest requires us to break up the existing corporate entity; U. S. v. Great Lakes Towing Company. The record satisfies us that the watch case business is not suffering from the absence of live and healthy competition, and except in the directions already mentioned, namely, the retail sales of the Howard watch, and the policy of boycotting, we think the court is not called upon to interfere.

The reason why the power to dissolve was exercised in the Standard Oil case, namely, that it was a violation continuing up to the filing of the petition, is pointed out by the Supreme Court in these words:

> "But in a case like this, where the condition which has been brought about in violation of the statute, in and of itself, is not only a continued attempt to monopolize, but also a monopolization, the duty to enforce the statute requires the application of broader and more controlling remedies," and is justified because "the acts and dealings established by the proofs operated to destroy the potentiality of competition * * * * but also to be an attempt to monopolize and a monopolization bringing about a perennial violation of the second section."

To this we may add that while the power to dissolve was for the same reason exercised by us in the Powder case, yet it will be observed there was in that case a refusal to enjoin as to certain defendants, the court saying: "As the only relief we can grant in this proceeding is injunctive, the petition must be dismissed as to any defendant who was not violating the law, or threatening to violate it when the suit was commenced." Indeed, in each of the cases the injunction was granted not to enjoin past violations, or because there had been violations in the past, but because such violations were continuing when the bill was filed. It will, therefore, appear that by this act a comprehensive plan of relief was mapped out "to *protect* trade and commerce *against* unlawful restraints and monopolies": first, a criminal prosecution by the government under sections one and two for all violations past and present; second, an injunction in equity, on complaint of the attorney general under section four, against all present or threatened violations of the



JUDGE VICTOR B. WOOLLEY

Judge Victor B. Woolley, who prepared the concuring opinion in the Steel Corporation case is the youngest member of the United circuit court of appeals, and was born on March 29, 1867. Soon after being admitted to the Delaware bar in 1890, he gained prominence as an attorney. In 1909, he was appointed to the supreme court of Delaware. He was appointed to the position he now occupies on Aug. 14, 1914, succeeding Judge George Gray.

act; and third, a civil suit under section seven by any one injured against any violator of this act.

Prayer of Petition

In pursuance of the power vested in him by section four above quoted, George W. Wickersham, then attorney general of the United States, on Oct. 26, 1911, filed this petition. Without entering into detail, we may say it prays that the Federal Steel Co., organized in 1898; the Carnegie Steel Co. of Pennsylvania, organized in 1890; the Carnegie Co. of New Jersey, organized in 1890, which held the stock of the Carnegie Steel Co. of Pennsylvania; the American Steel & Wire Co., organized in 1899; the National Tube Co., organized in 1899; the National Steel Co., organized in 1899; the American Sheet & Tin Plate Co., organized in 1898; the American Steel Hoop Co., organized in 1899; the American Sheet Steel Co., organized in 1900; and the United States Steel Corporation, which acquired the stocks of said companies, be held unlawful monopolies, and that the United States Steel Corporation, and each and all the said units composing it be decreed to be illegal and be dissolved, and that their officers and stockholders be perpetually enjoined.

Seeing, then, that the remedy here sought is that of both dissolution and injunction, we turn to the statute to ascertain on what state of facts dissolution should be decreed or injunction awarded.

Words Are Clear

The words of the statute are few and clear. Manifestly, the trade which it seeks to protect is the natural and normal buying and selling of property, and the protection it gives is by preserving to all engaged in such trade, this trade-right of natural and normal buying and selling, free from unlawful restraints and monopolies. For it will be observed, the statute is not directed against all restraints and all monopolies, but "against unlawful restraints and monopolies". This naturally raises the practical question, what are the lawful restraints and monopolies which the statute impliedly does not forbid, and what are the unlawful restraints and monopolies which it not only expressly forbids, but enjoins and indeed makes criminal? In the late case of Nash v. United States, 229 U. S. 373, the Supreme Court referring to its former decisions clearly defines what the statute forbids and does not forbid, as follows:

> These cases may be taken to have established that only such contracts and combinations are within the act as, by reason of intent or the inherent nature of the contemplated acts, prejudice the public interests by unduly restricting competition or unduly obstructing the course of trade.

The present case involves the legality not of a contract, but of a combination, that is, the legality of the United States Steel Corporation, which the petition asks to have dissolved. Therefore, applying the foregoing definition of the Supreme Court to the case in hand, the basic question for us to decide is one of fact, namely, whether the union of the several defendant companies in the United States Steel Corporation "prejudices the public interests by unduly restricting competition or unduly obstructing the course of trade". The public interests thus prejudiced consist of—first, competitors in trade; second, the purchasing public; and third, the general public. For example, if this steel company was in any way guilty of unfair business competition, if it was guilty of such conduct as to unfairly force a competitor out of the steel business, or if it unfairly prevented those who wanted to go into the steel business from doing so, then the steel company was, in the judgment of the Supreme Court, prejudicing the public interests by unfairly driving individ-

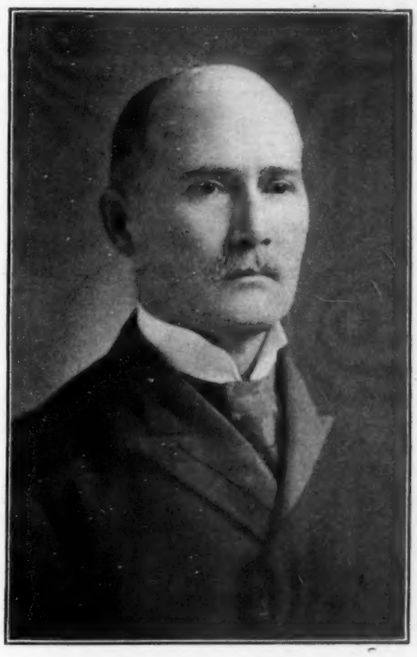
uals out of business or preventing them from entering it, and it was also injuring the public by unduly restraining trade. So, also, if this steel company was restricting output in order to exact unfair prices; if it was buying up competing plants and dismantling them to needlessly restrict output; if it was by reason of its controlling power furnishing the public with inferior goods; if it was using its power to needlessly and unfairly reduce wages; if it was seeking to deceive purchasers by a false appearance of competition, when in fact it owned or controlled such seeming competition, then it was prejudicing not only that portion of the public which desired to buy steel, but the public interests generally, by unduly obstructing the course of trade and thereby preventing the steel business from moving in its natural and normal channel.

A study of the various anti-trust cases shows that such unfair, prejudicial acts as we have thus instanced have been found where the Sherman law has been held to have been violated. Thus in the Standard Oil case, supra, page 76, the Supreme Court, referring to the conduct of that company toward its competitors, says:

We think no disinterested mind can survey the period in question without being irresistibly driven to the conclusion that the very genius for commercial development and organization which it would seem was manifested from the beginning soon begot **an intent and purpose to exclude others** which was frequently manifested by acts and dealings wholly inconsistent with the theory that they were made with the single conception of advancing the development of business power by usual methods, but which on the contrary necessarily involved the intent to drive **others from the field** and **to exclude them from their right to trade** and thus accomplish the mastery which was the end in view. * * * * * The exercise of the power which resulted from that organization fortifies the foregoing conclusions, since the development which came, the acquisition here and there which ensued of every efficient means by which competition could have been asserted, the slow but resistless methods which followed by which **means of transportation were absorbed** and brought under control, the system of marketing which was adopted by which the country was divided into districts and the trade in each district in oil was turned over to a designated corporation within the combination and **all others were excluded**, all lead the mind up to a conviction of a purpose and intent which we think is so certain as practically to cause the subject not to be within the domain of reasonable contention.

Like unfair conduct toward competitors marked the Tobacco case, 221 U. S. 106. It was there said:

The history of the combination is so replete with the doing of acts which it was the obvious purpose of the statute to forbid, so demonstrative of the existence from the beginning of a purpose to acquire dominion and control of the tobacco trade, not by the mere exertion of the ordinary right to contract and to trade, but by methods devised in order to monopolize the trade **by driving competitors out of business, which were ruthlessly** carried out upon the assumption that to work upon the fears or play upon the cupidity of competitors would make success possible. We say these conclusions are inevitable, not because of the vast amount of property aggregated by the combination, not because alone of the many corporations which the proofs show were united by resort to one device or another. Again, not alone because of the dominion and control over the tobacco trade which actually exists, but because we think the conclusion of wrongful purpose and illegal combination is overwhelmingly established by the following considerations: a. By the fact that the very first organization or combination was impelled by **a previously existing fierce trade war, evidently inspired by one or more of the minds which brought about and became parties to that combination.** b. Because, immediately after that combination and the increase of capital which followed, the acts which ensued justify the inference that the intention existed to use the power of the combination as a vantage ground to further monopolize the trade in tobacco **by means of trade conflicts designed to injure others, either by driving competitors out of business,**



JUDGE JOHN B. McPHERSON

Brilliant service which he had rendered in lower courts was rewarded when Judge John B. McPherson was placed on the bench of the United States circuit court of appeals about three years ago. Like himself, Judge McPherson's father was a distinguished jurist. Judge McPherson was born Nov. 5, 1846, and was admitted to the bar at Harrisburg, Pa., in January, 1870. In 1882 he was appointed to the bench of the twelfth judicial district in Pennsylvania. In 1899, President McKinley appointed him judge for the eastern district of Pennsylvania. His present appointment followed next.

or compelling them to become parties to a combination.

It will also be seen the evidence of intended monopoly and throttling of competition was found in the buying up of plants, not commercially needed, and then dismantling them. Thus in the Tobacco case, supra, pages 182 and 183, it was said:

We think the conclusion of wrongful purpose and illegal combination is overwhelmingly established by the following considerations: * * * * By persistent expenditure of millions upon millions of dollars **in buying out plants, not for the purpose of utilizing them, but in order to close them up and render them useless for the purposes of trade."**

Taking steps to keep others from entering the business is also recited as a violation of the act:

The conclusion of wrongful purpose and illegal combination is overwhelmingly established by the following considerations: * * * * By the gradual absorption of control over all the elements essential to the successful manufacture of tobacco products, and placing such control in the hands of seemingly independent corporations, **serving as perpetual barriers to the entry of others into the tobacco trade.**

So also in the Keystone Watch case, unfair conduct toward competitors constituted the violation of the statute. Speaking for this court, Judge McPherson there said:

Beginning in 1904, or thereabouts, it made several attempts—perhaps not very numerous, but numerous enough—that showed a definite purpose to restrain trade by **attempting to fix and maintain prices,** and **by using a species of boycott or blacklisting in order to lessen the trade of its rivals.** We shall not stop to detail the attempts of this character that were made during the period from 1904 to 1910, because the policy and system to which we refer were manifested with unmistakable distinctness in the latter year, and were carried on with vigor and persistence. * * * * * Now what the defendant company did was either to close these already existing and already utilized outlets, or to narrow them materially, so far as the (watch) cases of its competitors were concerned; and we think the proposition need not be discussed, that this was pro **tanto** a direct and unlawful restraint of trade.

So also amongst other factors which tended to show a violation of the statute, reference was made to the Tobacco case, page 174, to the maintenance of a false appearance of competition:

"The record indisputably discloses that after this merger the same methods which were used from the beginning continued to be employed. Thus, it is beyond dispute, * * * * that the new company has besides acquired control of eight additional concerns the business of such concerns being now carried on by four separate corporations, all absolutely controlled by the American Tobacco Co., although *the connection as to two of these companies with that corporation was long and persistently denied.*"

In the Powder case, oppression of competitors existed and was thus referred to, Judge Lanning speaking for this court:

"The association of manufacturers of powder and other explosives had probably never been stronger than it was in February, 1902, when the change in the management of the Du Pont works took place. It had for years *arbitrarily fixed prices* in the different parts of the United States, waging a disastrous *war against competitors until they were coerced into terms satisfactory to the association or brought into the association.* * * * * * * *Measures were often devised to limit the output of members of the association and to crush competition by manufacturers not members of the association.*"

Facts to be Determined

The tests of the violation of this statute having, then, as we have seen, been adjudged by the Supreme Court,

Nash v. United States, supra, namely, whether the acts in question "prejudice the public interests by unduly restricting competition or unduly obstructing the course of trade", it would appear the questions of fact for us to determine from the evidence are these:

First: Was the Steel Corporation, when this bill was filed in 1911, prejudicing the public interests by unduly restricting competition or unduly obstructing the course of the steel and iron trade between the states or with foreign nations? If this question be answered yes, the law was then being violated and an injunction should issue to restrain present and future violations.

Second: Did the Steel Corporation, when it was formed in 1901, either by the intent of those forming it, or by the inherent nature of that company's contemplated acts, prejudice the public interests by unduly restricting competition or unduly obstructing the course of the steel and iron trade, interstate or foreign? If this question be answered yes, then the law was violated and the Steel Corporation must be adjudged originally illegal. If illegal, it must be dissolved, because only thus can its inherent nature be prevented from continuing to work further violations of the statute. On the other hand, if these questions are negatived, then the Steel Corporation should not be dissolved, but permitted to pursue that usual course of trade, which it was the purpose, as we have seen, of this statute to protect. It will thus be seen that, as stated at the outset, this case is practically one of business facts.

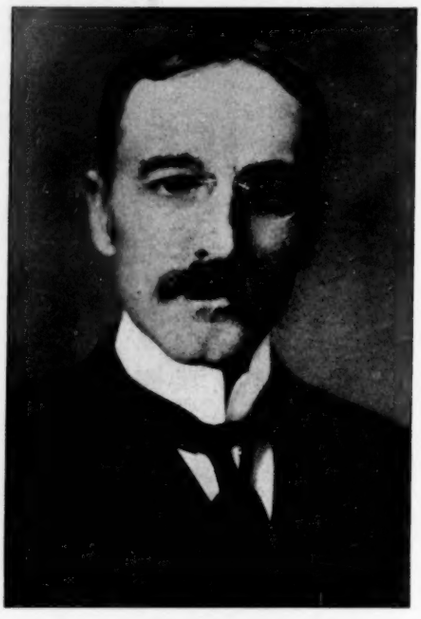
The Iron and Steel Trade

Turning, then, to the first question, let us address ourselves, first, to the iron and steel trade here in the United States and inquire whether the evidence satisfies us that the Steel Corporation, when this bill was filed in 1911, was then prejudicing the public interests by unduly restricting or unduly obstructing the steel and iron business of the United States. In considering that question, a number of fields of inquiry naturally suggest themselves. Had this company in 1911 a monopoly of the steel and iron trade of the country? What had been and was then its business conduct toward its competitors? Was it fair or unfair? Had it forced or was it forcing others out of the steel trade by unfair conduct? Had it prevented others from entering it? Was it then exacting, or had it exacted from the public undue prices for its product? Had it lowered the character of its product? Had it cut down, or was it cutting down, its output so as to restrict proper supply? Had it taken advantage of its power to unduly reduce wages? All these, as we have seen from the Standard Oil, the Tobacco, the Powder, and the Keystone Watch cases, were inquiries by which the question could be determined, whether the Steel Corporation was acting as the Supreme Court said in the Standard Oil case, page 58, with "the legitimate purpose of reasonably forwarding personal interest and developing trade", or, on the other hand, "with the intent to do wrong to the general public and to limit the right of individuals".

Competitors Know

Now as trade is a contest for it between different persons and the gain of that trade by one means the loss of it to another, it follows that the person who best knows whether the man who gained it gained it fairly is the man who lost it. If there is monopoly, if unfair business methods exist, if the course of trade and fair trading is throttled, we can find proof of it from business competitors. Trade competitors are the first to feel the pinch of unequal, unfair and undue restraint of the natural and normal course of trade. Being the first to suffer, they are the keenest to condemn. Turning, then, to this Steel Corporation's competitors, let us decide from the proofs whether the Steel corporation had, when this bill was filed, a monopoly of the iron and steel business of the United States.

We turn, first, to finished roll products because they are the basic supply to the vast number of varied industries throughout the country dependent thereon. If all these minor industries are dependent on a monopolized source of an indispensable base, we can say without going further that not only such industries, but the general public, are prejudiced. For as said and held by the Supreme Court in the Tobacco case, wrongful purpose and illegal combination are established "by the gradual absorption of control over all the elements essential to the successful manufacture of tobacco (steel) products." Indeed, the importance of such basic supply in the independent steel trade is shown by the fact that in the congressional investigation of the Steel Corporation, made by congress by resolution of Jan. 28, 1905, hereafter referred to, the second inquiry there ordered was, "To what extent said corporation and its associates control the output and prices of the *finished products made by independent companies* dependent upon it for their raw materials." What, then, are the facts in reference to finished roll products? In that regard, the evidence is that in 1911, the finished roll product —which excludes pig iron, steel castings and ingots—of the United States (using in this opinion when quoting figures round numbers, and by the term "Steel Company" or "Steel Corporation" meaning the United States Steel Corporation), was 19,000,000 tons. Of this tonnage the competitors of the Steel Corporation produced 54 per cent, or 10,300,000 tons, while the Steel Corporation made 8,700,000 tons. But not only did its competitors produce in 1911 the major part of the country's finished roll product as above, but, judging from the past, the present proportionate lead of the competitors bids fair to increase. In 1901, when the Steel Company formed, the total finished roll product of the United States was 13,000,000 tons. This was substantially divided between 49.9 per cent made by its competitors, and 50.1 per cent by the Steel Company. While both together have since increased the nation's product from 13,000,000 to 19,000,000 tons, yet of this 6,000,000 increase, its competitors produced 3,400,000 tons to the Steel Company 2,600,000 tons.



JUDGE WM. H. HUNT

Judge William H. Hunt was appointed in December, 1910, as an additional United States circuit judge, after an active, and long career of an enviable nature. Judge Hunt was born in New Orleans, in 1857, served as collector of customs on Montana and Idaho, as member of the Montana constitutional convention in 1884, of the legislature of that state in 1889, and from 1894 to 1900 was justice of the supreme court of Montana. In the latter year, he was appointed secretary of Porto Rico. From 1904 to 1910, he was United States district judge in Montana and from January, 1910, to February, 1911, was associate judge of the United States court of customs appeals. His home is in Helena, Mont.

Taking steel ingots, another basic supply on which great numbers of finishing industries are ultimately dependent, we find that while in 1901, of the 13,000,000 tons of the total American ingot production, the competitors of the Steel Company only made 4,500,000 tons, as against the Steel Company's 8,500,000, yet by 1911, in the country's vast increase from 13,000,000 to 24,000,000 tons, the competitors had increased their production by 6,500,000 tons, while the Steel Company had only increased 4,500,000. In other words, while the Steel Company produced, in 1901, 66 per cent of the country's ingot production, it was producing but 54 per cent in 1911.

In pig iron, the basic supply of foundries, finishing mills and other dependent industries, the relations were slightly the other way. In 1911, out of a total cast of 22,000,000 tons of pig iron (S. C. page 405), only 12,000,000, or 54.8 per cent were made by competitors of the Steel Company, as against 9,000,000, or 56.8 per cent made by such competitors in 1901, out of a total of 6,000,000; a decrease of 2 per cent.

No Monopoly

These facts and figures, bearing on basic supplies of the country's dependent iron and steel industries, satisfy us that there is no monopolistic control anywhere of such basic factors as ingots, pig iron and rods, and the testimony

hereafter referred to satisfies us that any substantial producer of such basic articles can, by selling such products at such lower price as he sees fit, compel all producers of such supplies, including the Steel Corporation, to also lower their prices. So also monopolistic control of finished steel articles in wide use would be a matter of grave public prejudice. Taking, for example, wire production, in which, through fencing, nails, and the great range of articles made from wire products, so many people are interested. When the Steel Corporation was formed in 1901, of the 9,000,000 kegs of wire nails then made in the United States, the competitors of the Steel Corporation made 3,000,000 kegs, the Steel Corporation 6,000,000. By 1911, the country's production had grown to 13,000,000 kegs, but of the 3,500,000 kegs of increase, the Steel Corporation made 1,000,000 kegs, as against its competitors making 2,500,000 kegs. The net result was that when this bill was filed, the Steel Corporation's competitors had 6,500,000 kegs, and the Steel Corporation 7,000,000 kegs of the country's total production of 13,500,000 kegs. So of wire netting, fencing and other wire products in general use. The general average of the nation's total production made by competitors when this bill was filed was 78 per cent. It will be seen that in this particular respect, due no doubt, as we shall see, to the growth of its foreign trade in wire products, the Steel Corporation had slightly increased its proportion from 20 per cent of the total product of 1901, to 22 per cent in 1911. But at the same time it will be noted that as the very large part of the Steel Corporation's increase in wire products was made in foreign trade. (the proofs, vol. 10, page 3902, show that only 42 per cent of the Steel Corporation's wire product of 1911 was sold in the United States) it was in 1911 making relatively much less of the wire products consumed in the United States than it was in 1901.

In the important item of structural steel used in bridges, steel frame buildings, steel car frames, etc., the Steel Corporation's competitors produce about 67 per cent, the Steel Corporation 33 per cent. And for the same reason as shown above, in the growth of the foreign trade, it will be seen by an analysis of defendants' exhibit, Vol. 3, page 317, and Vol. 2, page 204, that in structural shapes, as in wire products, the Steel Company, was in 1911, making relatively less structural articles of this country's consumption than it was in 1901.

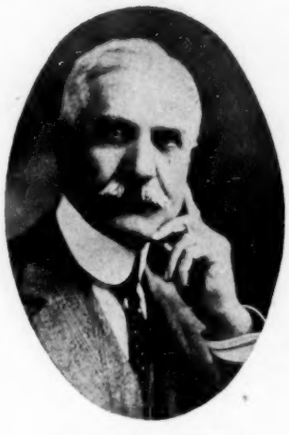
So also in steel rails. In 1901, the competitors of the Steel Company made 1,100,000 tons of steel rails, the Steel Company 1,700,000 tons. In 1911, its competitors made 1,200,000 tons, an increase of 100,000 tons, while the Steel Company made 1,600,000 tons, a decrease of 100,000 tons.

Summarizing our study of the proofs of this general subject, of the relative part of the Steel Company and its competitors in the total iron and steel production of the country and their relative part in the home market,' we find that, taking the ten years from 1901, when the Steel Company was formed, until 1911, when the attorney general filed this bill to dissolve it, its competitors starting in 1901, with making 49.1 per cent of the nation's production of finished roll products, including structural materials, rails, sheets, rods and bars, had by 1911 so increased their relative proportion that they were then producing 53 per cent of the nation's iron and steel output. And confining ourselves for the present to the production of 1911 used in the trade of the United States, which alone we are now considering, we find that the total amount of such iron and steel products in the whole market in that year, nearly 60 per cent of it was produced by the competitors of the Steel Company. These conclusions, based as they are on proven, practical business facts and figures, show a strong trend away from any monopolistic absorption or trade-restraining control of iron and steel manufacture or markets of the United States by the Steel Corporation. On the contrary, these figures show a strong trend in that manufacture and market toward an even greater absorption thereof by the virile and growing competitors of the Steel Company. And this leads us, in an adequate discussion of the case, to at this point take up the character of the competition in the steel and iron business in this country, for we may rest assured of the practical fact that where in any business there exists a healthy, normal, unrestrained and virile competition which all are free to enter, the individual has full freedom of business opportunity and the public is in no danger of prejudice from monopoly or trade restraint.

A Popular Idea

When the steel business of the United States is referred to, one thinks of it as practically being in the hands of the United States Steel Corporation. Circumstances have made this natural. The manufacture of iron and steel in their basic form is confined to local districts. Outside of these localities and outside of those engaged in the steel business there was, prior to 1901, but little general knowledge or appreciation of its magnitude and its basic relation to the general business of the country. When, therefore, this great steel company was quickly formed in that year and became at once the largest corporate capitalization known, it naturally and at once became associated in the general mind with absolute, monopolistic control. But the fact that the Steel Corporation, after due selection by it of such lines of finishing mills as were deemed necessary to carry out its plans, left outside of it a most strenuous body of strong competitors was not then generally recognized. The names, location and resources of those great competitors were not then and indeed are not now known to those outside the steel and iron business. Nor was the significance of the anti-monopoly, competitive powers and policies of such competitors appreciated. Indeed, the

Great Lawyers For The Corporation---Lindabury and Severance



R. V. LINDABURY

Taking the leading roles in the defense of the Corporation were two of the most brilliant, widely experienced figures in the legal firmament, Richard V. Lindabury, chief counsel, and Cordenio A. Severance. Both have been through many extremely important battles of the law, and in each instance distinguished themselves. More striking proof of their standing and reliance placed in them could not have been offered than the fact that they were selected to take the tremendously difficult duties laid upon them as defenders of the Corporation in the most important suit ever brought under the Sherman law. Their knowledge of the law and the mass of facts and details which were merged in the case was a matter of intense admiration. Neither ever appeared to better advantage than in this suit. Mr. Lindabury was born in 1850 and was admitted to the bar in 1874. Mr. Severance was born in 1862 and was admitted to the bar in 1883.

C. A. SEVERANCE

business fact above found, namely, that in 1911, when this bill was filed, the competitors of the Steel Company were making and marketing nearly 60 per cent of the steel and iron produced in the United States would surprise many. Since therefore the gist of monopoly is the suppression of competition, we deem it pertinent to ascertain from the proofs the character and steady increase of competition in the iron and steel business since the Steel Corporation was formed. In doing this, we here note of its great competitors such only as have, in the ten years of competition between them and the Steel Corporation, made a higher proportionate gain of business than the Steel Corporation itself.

Growth of Competitors

Taking the Steel Corporation as the basis of comparison, we may say that while the proofs show a very material increase of 40 odd per cent in the Steel Corporation's business from 1901 to 1911, yet this very substantial increased they show such strong past, present and prospective competition as affords just ground for concluding that the steel and iron business of this country is not being, and indeed cannot be, monopolized by the Steel Corporation. For the real test of monopoly is not the size of that which is acquired, but the trade power of that which is not acquired.

Turning first to the Atlantic seaboard, we find there a competitive group composed of the Bethlehem Steel Co., the Pennsylvania Steel Co. and its subsidiary, the Maryland Steel Co. The two latter companies are additional to the above list, and are here referred to only to note their tide-water location as an advantage which the Steel Corporation, with its inwardly located works, does not possess. The works of the Pennsylvania Steel Co. are near Harrisburg Pa., and those of the Maryland Steel Co., at Sparrows Point, near Baltimore. These two companies have a combined capital and surplus of some $66,000,000,

the striking growth and development of the Bethlehem company was undertaken by one who helped form the Steel Corporation, who served as its first president, and who, if the object for which the Steel Corporation was formed was to monopolize the iron and steel business or to restrain trade, was warned of that intent. That such a man should attempt to build up a competitive business and succeed in expanding it as has been done, shows that he at least was convinced that the field of fair, free and full competition was open to him and others who desired to enter the steel business, and that the Steel Corporation had neither the business purpose nor the business power to monopolize the steel business or to throttle the growth of competition.

As we shall see later, the market reach of basic iron and steel plants is measureably restricted to its own district by freight limitations. (Stevenson, vol. 3, p. 1084; Gary, vol. 12, p. 4834; King, vol. 6, p. 2075; Thompson, vol.

Two Able Young Attorneys---Bolling and Reed

DAVID A. REED

These are days when rising young lawyers command the earnest respect of their older coworkers and contemporaries, as well as that of the learned members of the bench. The young lawyer of today who is forging to the front has a happy faculty of employing a minimum of oratory and a maximum of law and facts to drive home his case. Two excellent examples of the alert, up-to-date attorney are found in David A. Reed and Raynal C. Bolling, whose handling of their important parts for the Steel Corporation elicited much justly deserved admiration from the opposition as well as the defense. Their already bright records have been embellished anew with added honors. Mr. Reed, one of the junior counsel for the Corporation, is not quite 35 years of age, but is now well on his way to attain a fame like that of his father, Judge James H. Reed, a distinguished jurist before leaving the United States bench. Mr. Bolling, assistant general solicitor for the Corporation, is almost 38 years of age, and in his various activities for the Corporation has established a most enviable reputation.

R. C. BOLLING

percentage of the Steel Corporation's own business was less than that made by each of eight of its great competitors as follows:

Company and location.	Increase of production from	Percentage of increase.
Bethlehem Steel Co., So. Bethlehem, Pa.	1901 to 1913	3,779.7
Indiana Steel Co., Indiana Harbor, Ind.	1901 to 1913	1,495.9
La Belle, Wheeling, W. Va.	1901 to 1913	463.4
Jones & Laughlin, Pittsburgh, Pa. ..	1901 to 1912	206.7
Cambria Steel Co., Johnstown, Pa.	1901 to 1913	155.3
Colorado Co., Pueblo, Colo.	1901 to 1912	152.8
Republic Iron & Steel Co. Youngstown, O.	1901 to 1912	90.8
Lackawanna Steel Co., Buffalo, N. Y.....	1901 to 1911	63.2

Taking up these companies one by one, it will be seen that in location, facilities, capital and basic supplies and with large extensions (vol. 20, p. 7978) in view. Their ore supplies are drawn from the great Cornwall ore beds of eastern Pennsylvania and from Cuba where they have inexhaustible supplies of bessemer ore, which can be worked by steam shovels and are close to tidewater. Three matters have impressed us in reference to this seaboard competition: First, that the eastern seaboard iron and steel competition of the Steel Corporation has an ore supply wholly independent of Lake Superior; second, that their location near the seaboard gives in many cases substantial freight advantages over the Steel Corporation; and thirdly, that the greatest advance in ore and steel production in the past 10 years has been made by a seaboard competitor of the Steel Corporation, the Bethlehem Steel Co. And as bearing on the question of the alleged object of those who originally formed the Steel Corporation to monopolize and unduly restrain competition and obstruct trade, it is to be noted that

22, p. 9141). The supplies from which steel is made and the basic articles into which it is turned are of such bulk and weight as to thus localize or restrict their markets. Freight forbids such heavy product being hauled to far-removed markets. The existence and maintenance of strong competitive steel production on the seaboard is, therefore, a matter of grave import to the great section of the United States immediately tributary to the Atlantic coast. Into this seaboard region the Steel Corporation enters under freight burden, its bulk mills being substantially in the Chicago and Pittsburgh districts. The proofs show that its seaboard competitors named have, as noted, abundant ore supplies, cheap water freights and a great accessible surrounding market. Without entering into detail, we refer to some suggestive facts in the proofs. For example, the proofs (vol. 10, p. 4028) show that the Maryland Steel Co., through its coast line water freight of $2.50 per ton, so covers the terri-

tory supplied by Mobile, Galveston and other Gulf of Mexico distributing points as to exclude from that territory even the product of the Tennessee Coal, Iron & Railroad Co., now owned by the Steel Corporation, which pays a railroad freight of $3.40 per ton. The proofs (vol. 18, p. 7248) further show that with the enlargement of the Erie canal system Lake Superior ore will be canal freighted from Buffalo to New York at 28 cents a ton less than the same ore is rail-freighted from Lake Erie ports to the Pittsburgh district. With the enlargement of that canal, the proofs are (vol. 18, p. 7283), that blast furnaces are now planned for location on seaboard waters in New York Harbor limits. And it should be here noted that the proof is (vol. 11, p. 4182) that the whole steel industry of the United States could be duplicated on the Atlantic seaboard and inland (vol. 11, p. 4178) as far as Pittsburgh, and could be run on ores brought from Chili and Brazil alone. Lake Superior ores of the same metallic unit grade as the Brazilian would, in the view of the Michigan Tax Commission (government's exhibits, vol. 10, p. 2435), cost $7 a ton delivered at the Atlantic seaboard as against ore of $3 from Brazil, which the report states has "a tremendous field of high-grade bessemer iron ores running 65 to 68 per cent metallic iron". As to the Cuban ore the proof (vol. 17, p. 6862) is "The total cost will not in any case exceed $2.25 per ton, and in ordinary shipping seasons will probably not exceed $2.10 per ton. This means that the ore reaches Philadelphia at a net cost of 4 cents per unit of iron. It is the cheapest ore supply in the world delivered at eastern Atlantic ports or in German or English ports. * * * In normal years, Lake Superior ores at the extreme eastern points at which they could possibly be shipped to meet eastern or foreign ores would have to get a price of 9 cents a unit in order to compete." These facts and figures show that there is no basis on which to attempt ore monopoly. The proofs further show that to adequately enter this seaboard territory and meet the competition of those located on the seaboard, the Steel Corporation was forced to establish large local distributing warehouses on the seaboard. For example (vol. 10, p. 4060), the Corporation established, amongst several others, warehouses on the Atlantic coast near New York, carrying $2,000,000, and one at San Francisco carrying $4,000,000 of diversified steel products.

Bethlehem Progress

Proof of the strength and growth of this seaboard competition is found in the record of the Bethlehem Steel Co. That company, in 1901, its first year of competition with the Steel Corporation, made 18,000 tons of finished steel product, which was largely confined to rails. By 1913, it had increased its product to 700,000 tons. During that time it had also (King, vol. 6, p. 2120) entered into competition in structural steel, armor plate and varied steel products. Indeed, its chief products, structural steel (vol. 11, p. 4149) and open hearth rails (vol. 11, p. 4150), of which it is making 200,000 tons, have been developed since 1908. From 4,000 employes it has grown to 15,000. It has in view (vol. 11, p. 4336) further integration to the extent of making all the finished products made by the Steel Corporation. Its ore supply of a million and a half tons a year comes from Sweden, from the Adirondack regions in New York, from Chili and from Cuba, where it has practically inexhaustible reserves. The proofs as to these Chilean ore fields show that this Corporation and other tidewater steel plants are wholly independent of Lake Superior reserves. The Chilean beds outcrop; they are stripped instead of mined; they are within a short distance of the coast to which they are gravity-dropped. They are magnetic hematite and dry—a great saving in transportation, as will be appreciated by those familiar with the wetness of Lake Superior ores which necessitate the carrying of thousands of tons of water. The proofs show the substantial character of this competitor, with a surplus and capital of $55,000,000, and further integration in view.

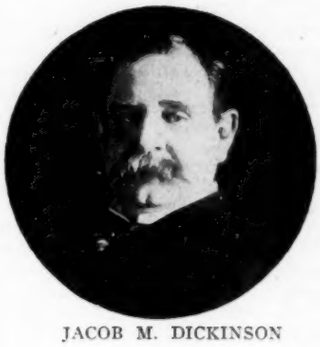
Youngstown Sheet & Tube Co.

Referring at this point to the existence of a fair and open competitive field, as sensed by practical men in the iron and steel industry, we gain light from the proofs in reference to the Youngstown Sheet & Tube Co., of Youngstown, O. That company does not appear in the foregoing list, because it came into existence after the Steel Corporation was formed. It is an inland company; its ore supply is from Lake Superior. It started the year after the Steel Corporation was formed. It purchased its reserve ore supply in 1903. It began with an investment of $600,000 which in the succeeding years has been increased to over $29,000,000. By 1913, it had an annual capacity of a million tons of ingots and sold that year over 800,000 tons. This company is cited as evidencing three things: First, that the men in the steel and iron trade, immediately after the Steel Corporation was formed, felt they had the opportunity to enter and prosper in the steel and iron business, both in the home and (Manning, vol. 19, p. 7968) foreign markets; second, they felt secure about their basic ore supply; and third, they were free to and did build up a great business in making steel ingots, one of the primary products or bases.

Jones & Laughlin Steel Co.

Coming next to the Pittsburgh district, we find a strong competitor of the Steel Corporation in the Jones & Laughlin Steel Co. which, at the time of the Steel Corporation's formation, the proofs show (government exhibits, vol. 4, p. 1513), was then so integrated as to make "a greater variety of product than any other steel or

Here's To The Vanquished---Dickinson and Colton



JACOB M. DICKINSON

Arrayed against them, the able counsel for the Steel Corporation had foemen worthy their steel. Vanquishing a lawyer-fighter like Judge Jacob M. Dickinson, who bore the brunt of the prosecution, is an accomplishment which carries with it added distinction for the victory and at the same time signifying that the prosecution had a case which could not be successfully supported by the law. If it had been possible to erect such a case, it goes without saying that Judge Dickinson, with the splendid aid he received from Henry E. Colton, special assistant to the attorney general, would have done that very thing. Mr. Colton, young, bright and resourceful, served his chief well, and, although on the losing end, may well cherish the laurels he won, or the victory he attained, despite his defeat. Mr. Dickinson worked hard and long in the case as special counsel for the government and his strong presentation of it made that fact plain. The prosaic, dull life of a secretary of war was too uninteresting for Mr. Dickinson; so he quit that job on May 21, 1911, to go to work on the dissolution suit, something calling for all kinds of action, care and fighting. He had returned to his first love, for previously he had been assistant attorney general of the United States, and even before then had distinguished himself as an attorney. Mr. Dickinson was born in 1851. Mr. Colton's difficult task of aiding in the preliminary work, taking important parts in the hearing, and helping on the government brief, was executed ably.

H. C. COLTON

iron company in the country". In 1901, its finished product alone was nearly one-half million tons. By 1912, it had increased that production to one and a half million tons. During that time it had integrated still further by building large additional works and had (King, vol. 6, p. 2120) entered into competition with the Steel Company and others in the manufacture of tin plate and wire rods. Like all these other competitors mentioned, the Jones & Laughlin company is thoroughly "integrated", that is, it has its own basic supplies and carries on its work in continuous process from ore to diversified finished steel products. It has large reserve holdings of ore in the Lake Superior region and an ore fleet on the Great Lakes with a carrying capacity of 40,000 tons. It has over $50,000,000 capital and a large surplus.

Cambria Steel Co.

Going east, we find at Johnstown, Pa., the Cambria Steel Co., a strong company also thoroughly integrated, and with an investment of nearly seventy millions. From 400,000 tons finished product in 1901, Cambria increased to nearly 1,200,000 in 1913, and it has (vol. 6, p. 2199) further improvements in view looking to a large increase in its output. It has a 50 years' supply of Lake Superior ore, and a lake fleet of a capacity of 50,000 tons. At this point, the president of this company might be quoted. He was called as a witness both by the government and the Steel Company. His testimony is enlightening, as showing that his and other companies in the steel business feel the Steel Corporation has no power, even if so disposed, to monopolize, restrict or stop their business. We quote (vol. 28, p. 12034) from his testimony.

Q. Have or not the leading competitors of the Steel Corporation, since 1901, increased their capacity or further integrated or added to their holdings of ore or coke?

A. Oh, yes, sir; there have been a great many new properties secured by the other companies, and a large number of developments in both the coking regions and the ore regions.

Q. And what would you say as to their progress, if they have made any in the matter of integration and diversification of products?

A. I think all of the companies have expanded and improved their plants and strengthened their holdings of raw material.

Q. In your testimony for the government, referring to Jones & Laughlin, the Lackawanna, Cambria, the Republic, and perhaps others, you stated as follows:

"I do not think that there is any one of those companies that could not compete with the United States Steel Corporation and compete successfully."

You were not then asked to give your reason for that opinion, be good enough to give them now?

A. It is a very simple proposition to build a furnace and steel plant, or finishing mills fully the equal of the Steel Corporation's and labor can be employed at exactly the same price, and there is absolutely no difficulty in producing the various products at practically the same cost.

Q. Has the Steel Corporation any such advantage owing either to its size, the extent of its integration or any other circumstance, as would enable it to put its competitors out of business, did it choose to do so?

A. No, sir. It would be impossible for it to do so without committing suicide.

Q. Why?

A. Well, their product is practically sold in this country—of course, they do a small export business—but they sell to the same people that we do, and we sell to the same people that they do, and if they would make prices so low that we could make no profit on it, there would be nothing left for the Steel Corporation; and if they would undertake to put us out of business by selling below our cost, they would be selling below their cost, so that I cannot see how it would be possible for them to put a well-managed concern out of business.

Q. Could the Steel Corporation confine any destructive warfare which it might undertake to any one competitor? In other words, could they wage a warfare against the Cambria or Jones & Laughlin, or any of the other considerable concerns without involving the rest of their competitors?

A. No, sir; that would be impossible.

Q. Could they confine any warfare that they might undertake either against a single competitor, or against all other competitors to any particular locality?

A. No, sir; because the markets are all affected in sympathy, and if the price was made below cost in the market only, we would go to the other; we would seek other markets.

Q. Why do you say that the Steel Corporation could not make war against one competitor only without involving the rest of them?

A. Because, for instance, we all sell to practically the same class of trade, to the same customers. We sell to many people who buy from Jones & Laughlin and the Steel Corporation and The Republic and the Inland Steel Co., and various other companies, so that it would be impossible to pick out the customers of any one manufacturer, and you cannot affect the price in one market without affecting it in all the other markets in the country.

Q. Has the ability of the Steel Corporation to resist any such warfare increased since 1901? Are they any better able to take care of themselves in such warfare now than they were in 1901?

A. No, sir; I would say that they are not. I do not fear the Steel Corporation as much as I fear other competition.

Colorado Fuel & Iron Co.

Without going into detail as to the other companies in the foregoing list, we may refer to the Colorado company, whose market, the proofs show (vol. 26, p. 10935) covers the United States west of the Mississippi. This company is integrated, is independent of the Lake Superior ore, has more than 60 years' supply of its own ores in Wyoming, New Mexico and Utah; and has largely expanded its plants since 1901. It has resources of $80,000,000 and its finished product has increased from about 200,000 tons in 1901, to about 500,000 tons in 1912. This company has, by its western location (vol. 26, p. 10937) a freight advantage over the United States Steel Corporation and all other eastern competitors in selling rails to most of the railroads west of the Mississippi.

Republic Iron & Steel Co.

The history of the next company is illustrative of the feeling of confidence and security among practical steel men, which warranted them in making since the Steel Corporation was formed large expenditures and entering into competition in the steel business. The Republic Iron & Steel Co., of Youngstown, O., was in 1901 engaged principally in making iron. Its finished product that year was some 500,000 tons. It has since expended $25,000,000 in changing its business from iron to an exclusively steel one. Like all other steelmakers, the Republic company's policy has been one of simply following the progressive and universal practice of integration incident to the development of the use of steel. The Republic company's process of integration, its president (vol. 2, p. 732) well describes:

"We have practically eliminated all our scattered iron mills, have concentrated them in the operation at a few points of production. So today we produce practically but little iron and are manufacturing about a million tons of steel per annum. This is what we call an integrating process; that was part of it, the addition of the mineral and coke and blast furnaces and balancing up operations generally, completing the integrating process. * * * * This integrating process that I speak of attended our development of the steel end of our business. We did not need it so much when we were simply manufacturing iron. It was done for economic and trade reasons on account of the increased demand for steel and the decreased demand for iron."

The Republic has increased the range of its product and production until it is now a million and a quarter tons and extends (vol. 28, p. 11999) all over the United States and Canada. It has gone into the Birmingham, Ala., field, where it has plants, as well as in Pennsylvania, Missouri, Illinois, In-

Triumph Over Clamor

By Wm. A. Rogers,

Rogers, Brown & Co., Buffalo.

The decision has met with the hearty and instant approval of business men far and wide. It is recognized as a triumph of justice over unjust popular clamor.

It is to be recognized, however, that the popular state of mind is now very different from what it was when this suit was instituted some years ago. Discussion, perspective and the widespread distress which attacks on business have occasioned, have clarified the mind and brought the country to see that its material interests are closely linked with the success of its business institutions. This decision is a tonic to general business conditions, its effect will be far reaching to the good of all industrial interests, and it is particularly opportune at this time when business is struggling hard to rise out of the slough of despond and adversity through which it has been so long floundering.

diana, Iowa and Michigan. It has acquired 40,000,000 tons of Lake Superior ore reserve and 80,000,000 in the Birmingham district and has a lake fleet of 18,000 tons. Its growth during this time was such (Topping, vol. 2, p. 735) that it is producing one-twenty-fifth of all the steel produced in the United States and one-thirtieth of all the iron. From a study of the testimony, there is no doubt that the men who made these large expenditures in 1906 were satisfied that the field of fair business competition in the iron and steel business was open to them. These expenditures were made in completely integrating its manufacturing facilities. This integration consisted (vol. 22, p. 9131) in increasing its blast and open hearth furnaces and ore supply and carrying their basic product forward to completion by additional plants which included finishing mills for merchant bar, for sheet bar, for billets and for plate, in addition to galvanizing works, rivet, spike, bolt and nut departments and by-product coke works. They have no more to fear from the competition of the Steel Corporation than they have from that of any other of their other competitors. The testimony of this company's president, who, like the Cambria's president, was called as a witness both by the government and the Steel Company, is instructive on that point. It is:

Q. Where is the market for your product?

A. All over the United States and Canada.

Q. Has the Steel Corporation in your opinion power to put the Republic out of business?

A. I think not.

Q. Has it the power to put its competitors generally or any of its principal competitors out of business?

A. I would say not.

Q. What is your reason for thinking that they have not that power?

A. I would have two reasons: one, that they have not the physical ability to do it, and secondly, if they attempted it, they would involve their own market to such an extent that they would suffer equally with us. What I mean by physical is this. Their principal competition, companies like ourselves and others as strong as we are, are properly integrated; in other words, being self-contained on raw material, well equipped, and at least very well managed and properly financed, so that a combination of that kind would give us as much power to produce within somewhere a close approximation of their cost; at least their difference would not be so great that they could put us out of business. They have some advantages and so have we.

Q. Now, as to your second reason, that it would involve them in loss as well as you, what do you mean by that?

A. Well, to illustrate, we might have a customer, we will say, in Michigan, engaged in the manufacture of agricultural implements, and another one in Illinois or Indiana. If we should sell in Michigan steel bars and plates that enter into the cost of production of a machine at a less price to A in Michigan than we do in Illinois, we would probably soon hear from B in Illinois, because those two men would naturally compete in the general market of the United States with their machinery. So it would be with all other fabricated products made from steel, the markets are inter-related and interlaced to such an extent that you cannot reduce prices, in my judgment, in one market, without affecting in a short time the market elsewhere for the same commodity.

Q. Could the Steel Corporation localize a destructive warfare against its competitors?

A. Not in my opinion.

Q. Why not, if there is any other reason than you have already indicated?

A. I should say that the reason I have already indicated would be a complete answer to that thought. There is a sympathetic relationship existing between all markets that is so close that my experience would compel me to say that you could not affect the price in Chicago without affecting the price in New York; as a matter of fact, that is the experience that we have had.

Q. And could the Steel Corporation wage a destructive warfare against any one of its competitors without involving all of them?

A. No; I will say not.

Inland Steel Co.

The same confidence to enter into competition thus evidenced in the Republic company was also shown by the Inland Steel Co. of Indiana. That company has expanded its investment from some $4,000,000 to $20,000,000. It has acquired Lake Superior ores and a Lake fleet of considerable capacity. Asked the question (vol. 22, p. 9144).

From your knowledge of the iron and steel business, the relative capacities of those engaged in it, the capitalization of the United States Steel Corporation, its ownership of railroads, its connection with financial interests, state whether or not in your judgment it has the potentiality, if it uses it, to destroy its competitors?

Its president testifies:

A. No; that is absurd. They cannot do it. I think it is a physical impossibility. I cannot imagine how they could do it.

Q. Is there any possible doubt in your mind of the ability of the Inland Steel Co. to maintain itself in any kind of competition?

A. Well, that is what we are aiming to do. We think so. We think we are getting as well prepared as most of our competitors by the money we have spent here; and I believe it has been spent on the right lines. I know that we would not change any of it if we had it to do over again, as far as we have gone.

Q. And you are very well integrated, as you have stated?

A. Yes; we did the best that it was possible to do.

Q. Mr. Thompson, you stated in answer to my question a short time ago, that the competition between the Inland Steel Co. and these other companies had been active in the territory that you serve?

A. Yes, sir.

Q. What do you mean by "active"?

A. Always at it. We were always trying to get business. I don't know how to express it any stronger than to say that we were all looking for trade in an active way, all the time keeping ourselves posted on conditions and soliciting business from just such men as the witness who was examined here this mornnig and from other railroads; I say it is active because we are always at it—all of us.

Other Competition

We have referred above to competitive steel conditions on the Atlantic seaboard as shown by the proofs. These proofs also show (Pigott, vol. 26, p. 11066) how competition to the Cambria, Jones & Laughlin and the Steel Corporation has grown on the Pacific coast. This competition has increased since the Steel Corporation was formed. Mr. Pigott testifies his company has built at San Francisco open hearth furnaces with a capacity of 30,000 tons; bar mills, with 30,000 tons capacity; and at Seattle a rail rerolling mill with a capacity of 30,000 tons. For its basic supply this company is wholly independent of the Steel company, Jones & Laughlin, the Cambria Steel and all eastern companies doing business on the Pacific coast. This is clearly shown by the proofs. This company gets one-half of its pig iron from China and the balance from the Republic company and the Tennessee Coal & Iron Co. The proof is (vol. 10, p. 3887) that the freight paid to deliver the Tennessee company pig iron from Birmingham, Ala., to San Francisco is $10.08 per ton. The proofs further show (p. 3889) that the Chinese pig iron is delivered at Pacific coast points at a freight rate of $3.70 per ton. If to this $3.70 be added the price of pig iron, $6.20 per ton, it will be seen that the Chinese pig iron at $6.20, plus freight, $3.70, $9.90, can be paid for and delivered on the Pacific coast for about the amount, $10.08, the Republic and the Tennessee company pays for freight alone. As the proofs (p. 3887) further show the pig iron from India is being delivered in San Francisco from Calcutta at an expense of $12.38 per ton, namely, price of pig iron, $5.40, plus freight, $6.98, it will be seen that the future basic supply of this and other companies that may spring up on the Pacific coast can be had of Asiatic pig metal wholly independent of the Steel Corporation and other eastern competitors. In view of the further proof (vol. 11, p. 4182) that the ores on the western coast of Mexico—and necessarily those of Chili—are also available, and that the improved practice in steel making (vol. 3, p. 992) makes ores now usable which were formerly not so, the con-

Load is Lifted

By J. Warner,
President Trumbull Steel Co.,
Warren, O.

This company was more than glad to know that the recent court decision was favorable to the Steel Corporation. The filing of this suit left in the minds of many, a doubt as to the fair dealings of the United States Steel Corporation, but those who have been associated with it, as the writer has, know that it is unusually fair and just in all its dealings. I have worked in an official capacity for the United States Steel Corporation and have also for a number of years been in a competitive business, and believe I voice the sentiment of all who really know the Corporation and its ways and methods.

The effect on general business cannot but be favorable and a load has been lifted from its shoulders.

clusion is warranted that the field for all possible development on the Pacific coast in the steel business is wholly free from any monopolistic control whatever. It will thus be seen that a substantial steel industry in rails, bars and open hearth steel has in fact grown up on the Pacific coast, while in competition with the Steel company, a competition which Mr. Pigott (vol. 11, p. 11074) describes "from the standpoint both of a customer and a competitor, has been beneficial".

As we have said, we have, as throwing light on the substantial character of the strong and increasing competitive forces in the steel business, referred only to those above named. It is proper, however, to add that the proofs in the case (defendants' ex. vol. 1, p. 137; vol. 2, p. 209-210; and vol. 3, p. 374), shows the Steel company has eight competitors in rolling structural shapes, that is, beams for bridges, sky scrapers, etc., and in the fabrication of such structural material over 300 competitors. In the rolling of merchant bars, it has very considerably over 100 competitive mills.

Phases of Monopoly

Later, we shall note the testimony of competitors as to their relation to the Steel Corporation, but before referring to individual relations, we deem it proper to here refer to some general phases of monopoly which affect all competitors. One of these was the practice by large companies of exacting freight rebates from railroads under threat of diverting shipments elsewhere. These practices were common up to the time of the ending of the old era of freights unregulated by the government (gov't. ex. vol. 3, p. 1120; vol. 2, p. 441; vol 3, p. 1031; vol 3, p. 1035, and the discussion in vol. 3, p. 956-7). In Swift & Co. v. United States, 196 U. S. 402, the Supreme Court said: "It is obvious that no more powerful instrument of monopoly could be used than an advantage in the cost of transportation", and in the Standard Oil case, supra, this subject was again referred to as "the acquisition here and there which ensued of every efficient means by which competition could have been asserted, the slow but resistless methods which followed, by which means of transportation were absorbed and brought under control * * * all lead the mind to a conviction of a purpose and intent which we think is so certain as practically to cause the subject not to be within the domain of reasonable contention". On Jan 28, 1905, congress directed (gov't. ex. No. 206, vol. 5. p. 1615) the secretary of commerce and labor to investigate the steel and iron industry of the country with a view to ascertaining to what extent the United States Steel Corporation controlled the output and prices of finished product made by independent companies dependent upon it for their raw material, and to report any restraints by it of commerce, foreign or domestic. James R. Garfield, who was secretary of commerce and labor, made this examination, was called as a witness. He testified (vol. 14, p. 6190) he had made an investigation and examination of the railways in a similar manner to that made in the Standard Oil and found no rebating whatever by the railroads to the Steel Corporation. That he was justified in his conclusion is strengthened by the fact that at a meeting of the Steel Corporation's executive committee in 1901, called to consider the policy of the company toward railroads, the minutes (gov't. ex. vol. 3, p. 957) show the position taken the first year of the Corporation's formation by its chairman, and there recorded, was "that we cannot afford to take the position of asking any railroad, directly or indirectly, to discriminate in our favor". This policy was later emphasized (vol. 12, p. 4790) in a letter sent to the presidents of the railroads (deft's ex., vol. 3, p. 295) handling the Steel Corporation's freight, as follows:

Sept. 20, 1906.

Personal.

Dear Sir: As you know, this Corporation long since adopted the unalterable policy of recommending to subsidiary companies in which it is interested that under no circumstances should rebates be solicited or received contrary to law. This policy will be strictly adhered to, and it is hoped and expected your subordinates will be advised and instructed accordingly. If any one should at any time violate his instructions in this respect, notice of the same should be promptly given to the president of the subsidiary company interested and also to the undersigned.

Yours very truly,

W. E. Corey, President.

Establishes Confidence

By E. R. Crawford,
President McKeesport Tin Plate Co., McKeesport, Pa.

We think the decision is in harmony with justice and fair dealing and we believe will result in better business conditions, because it will establish confidence in the impartiality of our courts, which will insure protection to large as well as small business against the demagogue.

In view of this announced policy of the Corporation, of the investigation made by the department of commerce and labor, of the absence of any complaints by any competitor, and of no proof of any freight rebate being given, we are justified in concluding that the Steel Corporation has not used or sought to use freight rebates as a means of undermining its competitors or of monopolizing business.

Trade War

We next turn to ruinous trade wars against competitors which, as we have seen, was one of the features of attempted monopoly denounced by the Supreme Court. In that connection, it is to be noted that under conditions incident to the steel trade the power of a large steel company to carry on a ruinous trade war against any particular competitor does not exist in the iron and steel industry. The customers of the great steel companies are large jobbers, and the purchasing agents of other companies, who are in the closest touch with every fluctuation of the steel market. The result is that any effort on the part of any one of these great steel companies to inaugurate a trade war by ruinously underselling a competitor would at once, owing to the sensitiveness and inter-related character of the steel market, result in forcing the company that was thus ruinously selling in any particular market or locality to in the same way ruinously lower its prices in every other community. In that respect, the president of the Youngstown Sheet & Tube Co., a competitor, testified (vol. 22, p. 9144), that, if the Steel Corporation attempted such a course "they would involve their own market to such an extent that they would suffer equally with us". The testimony of the president of the Cambria Steel Co., already quoted (vol. 28, p. 12036) is to the same effect, as well as that of the president of the Republic Iron & Steel Co. (vol. 28, p. 11999). And the practical impossibility of such a course is shown by Judge Gary (vol. 14, p. 5378), where he testifies:

I feel certain that by reason of our integrated proposition we had the advantage in cost of production over our competitors generally. If any one having advantage in any business is willing to sell down to his cost price, of course he would live while his competitors would starve; but that is a most unnatural position for any producer to take and long continue.

In view, therefore, of the uncontradicted proof of those familiar with the steel business, that no such ruinous trade war could with profit to itself, be carried on by the Steel Company against a competitor, and in the absence of proof of any effort by it to harrass them by such conduct, we are warranted in concluding there has been no attempt by the Steel Corporation to monopolize or restrain trade through ruinous trade wars against its competitors. For of the conduct of the Steel Corporation the views of its competitors is the best gage. Monopoly and unreasonable restraint of trade are, after all, not questions of law, but questions of hard-headed, business rivalry, and whether there is monopoly of an industry, whether trade is subjected to unreasonable restraint, whether there is unfair competition are facts about which business competitors best know and are best qualified to speak. And it may be accepted as a fact that where no competitor complains, and much more so, where they unite in testifying (Campbell, vol. 5, p. 1857; Smith, vol. 19, p. 7942; King, vol. 6, p. 2121; Bowron, vol. 25, p. 10247; Pigott, vol. 26, p. 11075; Manning, vol. 19, p. 7701) that the business conduct of the Steel Corporation has been fair we can rest assured, there has been neither monopoly nor restraint. Indeed, the significant fact should be noted that no such testimony of acts of oppression is found in this record as was given by the competitors of the Tobacco or Standard companies in the suits against those companies. We have carefully examined all the evidence given by competitors of the Steel Corporation. We have read the testimony of customers who purchased both from it and from its competitors. Its length precludes its recital here, but we may say its volume, the wide range of loca-

tion from which such witnesses came and their evidently substantial character in their several communities, make an inevitable conclusion that the field of business enterprise in the steel business is as open to, and is being as fully filled by the competitors of the Steel Corporation as it is by that company.

Testimony of Competitors

Taking as fair samples of the views of the competitors, we note, first, the testimony of James Bowron, president of the Gulf States Steel Co., who says: "Their competition is strictly fair." Herbert S. Smith, vice president of the Standard Steel Co. of Alabama, and formerly general sales agent of the Lackawanna Steel Co., of Buffalo, who says: "I have always regarded the competition of the Steel Company's subsidiaries as the fairest competition that we have." Of western manufacturers, we note that of William Pigou, president of the Pacific Coast Steel Co., who says, "I have always found the competition of the United States Steel Co. and its subsidiaries fair; its existence has been beneficial to the steel and iron trade of the country." We have noted above the remarkable growth of the Youngstown Sheet & Tube Co., which came into existence in 1905, and in the meantime has grown to be a very important competitor of the Steel Company. The testimony of James A. Campbell, its present president, who was called as a witness by the government (Vol. 5, p. 1857) so fully covers the subject of the attitude of the Steel Corporation towards its competitors and the purchasing public that we quote it at length:

"A. My experience is that it is the best competition we have; that they are open and above board in all of their dealings. Their prices are either published or we get direct information from them, or through our customers as to what their price is, and we find that their price is practically the same to everybody. With other competition that we have, with the independents, for instance, the independents vary more in their prices, and we never quite know what their price is. It may be one thing today and another tomorrow, and they do not conduct their business in the same way, because it is a smaller business and more of an individual business; and they will make prices according to the class of material pretty largely and the class of orders. So we were not as capable of gaging how they are conducting their business as we are in regard to the subsidiary companies of the Steel Corporation.

Q. Is your competition with these subsidiary companies of the United States Steel Corporation active and energetic and vigorous competition?

A. It is—very, at times. We sell to many of the same people that they do——the same class of material.

Q. Have you ever known of their having made low prices in a limited section of the country for the sake of attempting to put a competitor out of business?

A. I think not. I do not recall any time, with any company.

Q. Have they in your experience been guilty of any unfair methods to suppress competition?

A. I think in the early days— I did think in the first two or three years we were in business that there were some things done, and I think done without the knowledge of the higher officials, that were unfair; but those disappeared promptly, and there has been nothing of that kind—nothing but the fairest competition in every respect for the last seven or eight years.

Q. When the market has been falling, what has been your experience as to the prices which they have maintained as compared with those of the independents?

A. In depressed times, when there is not nearly enough business to keep all of the mills operating to their full capacity, their prices are usually higher than the independents. In good times, when the mills are all working to capacity, their prices are usually lower than the independents. The independents will accept bonuses and do things of that kind that I do not think the corporation will do. So that I think the general effect is for the steadying of prices and making them better for the country at large, and of course in dull times it is a great protection to the smaller manufacturers to have them keep their prices up, when business is slack, than it would be if they went out like the Carnegie Steel Co. did in the early days and took all the business and shut the other people down."

Schwab's Testimony

To this may be added the testimony of Charles M. Schwab, who knew the conduct of the company as one of its original officers, and later, as one of its competitors, felt the effects of its policy. We quote from his testimony (vol. 11, p. 4154-5) at length:

A. In the beginning of the Steel Corporation, during my presidency, the policy of the Corporation towards its competitors was not one of endeavoring to hurt, not one of endeavoring to stifle or to destroy, but the policy of naming a price for our products not only to our customers, but openly through the trade journals, if you will, because I used to give it to the *Iron Age* and *The Iron Trade Review* each week, and the sticking to these prices throughout the trade; there probably were exceptions of a minor character to very large consumers, but as a rule during my presidency of the Corporation the prices of its products were fixed and published, and they were what were charged the customers. Is that clear?

Q. You say you gave these prices to the public, as a rule, once a week?

A. I did.

Q. To the trade journals?

A. To *The Iron Trade Review* and *The Iron Age*.

Q. Are they the principal trade journals in the steel industry?

A. They are the principal trade journals.

Q. What has been the practice of the Corporation in those respects or along those lines since you left the presidency, as you have observed it, from the point of view of a competitor?

A. So far as I know, from the point of view of a competitor they have adopted since that time practically the same policy.

Q. Have you ever known of the Steel Corporation to have a published price and a secret price, different from the public one?

A. So far as I am concerned personally, I do not know of any.

Q. Have you ever known or heard of a case where the Corporation has sold at a less price in a particular market to drive out a competitor?

A. Never.

Q. Or has sought to obtain a customer of a competitor by secret rebates or departures from these open published prices?

A. I have never heard of such a thing.

Q. Either while you were president or since you have been a competitor?

A. Never.

A Good Combine

By G. H. Thompson,
President Columbus Malleable Iron Co., Columbus, O.

We are very decidedly of the opinion that it is in entire harmony with justice and cannot help having a very favorable effect on general business conditions, as it is an assurance that business even in a big way is carried on honestly and entirely within the law, and from now on will not be burdened with the suspicion and uncertainties that have been hampering it for some years past. The combination of capital, brains and integrity is no longer criminal.

Interest of the Public

We next turn to that most injurious feature of monopoly's wrong to the public, to wit, increase in the price of its product or a deterioration in quality. Turning first to the basic question of quality, no dispute arises under the proofs. They are simply uniform that both with independents and the Steel Corporation there has been a steady bettering of quality in steel products. This factor of improving its product has been recognized by the Steel Corporation and a study of the testimony of its buyers satisfies us that this progressive growth in quality by the Steel Corporation has been the principal means by which it has acquired and held its business.

Turning next to the increase in price, we are met by two aspects of the case. Two learned experts have been called—one by the government, and one by the Steel Corporation—who draw different conclusions as to whether there was an increase or decrease in the price of iron and steel products. The deductions of both are supported by weighty contentions and numerous enlightening charts. The able reasoning of both has had the thoughtful consideration the standing of the two men challenges. We may note that the different ranges of time they have taken as the basis of their reasoning, really makes them reason about two different things. But apart from that, we think whatever may have been the range of iron and steel prices during the periods of consideration selected by each, the proof is (vol. 28, p. 12000) that in these days of quick communication the general price of steel and iron products cannot be localized, but is interdependent in this country, and indeed, (vol. 28, p. 12013) internationally so. That proof is that when there is an over-supply, even in the European steel and iron market, that market tends to unload on the American steel market, and on the other hand, when there is an over-supply here, this country seeks to dump on their markets at any price. Without citing the proof in that regard, we may refer to Corrigan, vol. 26, p. 11096 and 11102; Moller, vol. 19, p. 7666; Topping, vol. 28, p. 12013; Kahn, vol. 23, p. 9483. It will also be observed that so sensitive and interrelated is the price of steel and iron

that a drop in price of any particular branch of steel leads to a drop in all other branches: (King, vol. 6, p. 2114; Schwab, vol. 11, p. 4387; Kennedy, vol. 5, p. 1873; Topping, vol. 2, p. 682).

No Unreasonable Advances

No evidence is produced showing that there has been at any time an arbitrary or unreasonable increase in price of any one of the numerous products of the Steel Corporation. On the contrary, the proofs (gov't. ex. vol. 14, p. 2912-22) show decreases in important steel products, among which we may refer to wire nails, which from selling in 1901 at $51.00, when the Steel Corporation was formed, were, in 1911, when this petition was filed, selling at $36.00. During the same time, steel bars receded in price from $33.00 to $25.00. Steel beams dropped from $36.00 to $27.00; billets from $27.00 to $24.00; and a statement taken from the Steel Corporation's accounts (def't. ex. vol. 2, p. 203) shows there was between 1904—a date when the Steel Corporation may be said to have been fairly systematized and under way—and 1912, a decrease in fabricated prices received by the company of 19 per cent and of all other products, of 11 per cent. Summing up the business result, the president of the Corporation (vol. 10, p. 3854) testified, the Steel Corporation was in 1912, getting about $8.00 a ton less for materials in the domestic market than they were receiving in 1904. Moreover, it should not be overlooked that during these years there were substantial factors of increased expense in the cost of manufacture. The freight on coke (vol. 10, p. 3781) of which the Corporation uses some 40,000 tons a day, has increased 12 per cent since 1901; the freight on limestone, which constitutes one-third of a furnace's burden, has increased 10 per cent since 1901; and iron and steel wages (vol. 10, p. 3895) have increased 28½ per cent.

Standing aside for later discussion the matter of the Gary dinners and the meetings following them through which it is alleged the Steel Corporation in co-operation with its competitors unduly restrained and obstructed the normal course of the steel trade, and confining ourselves to the fixation or control of prices by the Steel Corporation itself, or its subsidiaries, we may say we have found in this record no proof by any witness showing any instance in which the Steel Corporation or its subsidiary companies has set either an arbitrary, exorbitant, unfair or controlling price on any one of its numerous products. It is a mere truism to say that the fixing and maintaining by a manufacturer of a fair price above cost is not only a right but a commercial necessity, and any other course must end in his bankruptcy. When such fair prices are departed from and they are unreasonably raised and exacted from the purchasing public, the public is prejudiced thereby. On the other hand, when that price is so unreasonably lowered as to drive others out of business, with a view to stifling competition, not only is that wronged competitor individually injured, but the public is prejudiced by the stifling of competition. Between these two price extremes there must in the nature of things be a considerable zone of reasonable price variation, and what is a fair price is a question which can only be determined by a careful ascertainment from cost sheets and other data of such fair price. In the present case, neither side has furnished this court with proof from which we could intelligently determine whether the prices charged by the Steel Corporation for any of the numerous articles here involved, beginning, for example, with pig iron and ending with rails, was unfair, exorbitant or unreasonable. In the absence of such testimony, it is manifest that for this court to assume that the prices at which any of these articles were sold by the Steel Corporation and its competitors were unfair, would be to base such conclusion on surmise instead of proof. But there is not only this absence of testimony in regard to the prices received being unfair and exorbitant, but there is, on the other hand, affirmative testimony which we cannot disregard, and which, as it seems to us, constrains us to conclude that the prices of the product sold by the Steel Corporation have been the result of the joint action of the law of supply and demand and of that vigorous rivalry which has at all times existed between the Steel Corporation and its competitors. In that respect, we have the testimony of the Steel Corporation's great competitors, of large and small manufacturers over the whole country who purchased basic steel products and put them through other stages in their mills and factories; of jobbers and warehousemen who buy and hold for sale large stocks of steel products. The testimony of these men—and there is no testimony to the contrary—is that the iron and steel trade in the various products of the Steel Corporation is and has been open, competitive and uncontrolled, and that all engaged therein have free will control in selling at their own prices. This important fact we shall not leave to here stand as a statement of a conclusion reached by us from a study of the testimony in volumes 18 to 28, inclusive, but at the risk of unduly prolonging this opinion, we shall here spread of record the testimony of a few witnesses on that subject, so that he who runs may read.

More Than Delighted

By John Jordan Jr.,
President Williams Tool Co.,
Erie, Pa.

I am more than delighted that the courts have decided in favor of the Steel Corporations, and believe the decision to be fair and just.

The decision should have a beneficial effect on general business inasmuch as it will enable big business to go forward with confidence.

Testimony as to Prices

In taking up that question we have in the first place the proof that so far as the prices charged by the Steel Corporation are concerned, its practice has uniformly been to give the utmost publicity to such prices. In that regard, Charles M. Schwab, a former president, testified (vol. 11, p. 4154), as already noted above:

> In the beginning of the Steel Corporation, during my presidency, the policy of the Corporation (was) * * * * of naming a price for our product not only to our customers, but openly through the trade journals, if you will, because I used to give it to *The Iron Age* and *The Iron Trade Review* each week, and the sticking to these prices throughout the trade; there probably were exceptions of a minor character to very large consumers, but as a rule, during my presidency of the Corporation, the prices of its product were fixed and published and they were what were charged the customers. * * * So far as I know, from the point of view of a competitor (the witness is now president of the Bethlehem Steel Co.) they have adopted since that time practically the same policy.

That these published prices are met in vigorous competition, the proofs show. President Campbell, of the Youngstown company, speaking of his company, says, in substance that their (vol. 5, p. 1857) competition with these subsidiary companies of the United States Steel Corporation is active and energetic and vigorous, very at times. "We sell to many of the same people that they do—the same class of material." The sales manager of that company (vol. 19, p. 7701) testified that the subsidiaries of the United States Steel Corporation have been their competitors in these various lines of production and sales in every line they manufacture, and throughout the country. The competition has been very severe.

The president of the Colorado company (vol. 26, p. 10940) says that in the bar mill products, they meet Jones & Laughlin, the plants of the Steel Corporation that make these products, the Cambria Steel Co. in some of them. The competition has been vigorous and independent and unrestricted, so far as it affected them. He thinks the competition has increased in extent. There are two or three new elements in the field and that has made all the old ones a little more active, including themselves. The testimony of the sales manager of the La Belle Iron Works, of Steubenville, O., may be taken as generally typical of the existence of an open steel market in competition with the Steel Corporation. That company had, during the 10 years following the organization of the Steel Corporation, increased its product of finished billets, sheet bars, nails, tubes, plates, skelp, and sheets, largely over 400 per cent, and its market covered the entire country, Mexico and Canada. Its sales manager (vol. 19, p. 7876) said that their competitors are all the leading steel companies, pretty near,—take the Lackawanna, Cambria, Republic, the Youngstown Sheet & Tube, the Wheeling Steel & Iron Co. and the various constituents of the Steel Corporation. The prices which they obtain for their steel products are not fixed in agreement with their competitors. That is true of each and every year of the 10 years that he had been general manager of sales. It is true of each and every article they have produced and sold in the market. There has been no time during the 10 years when the price of any article they have produced and sold has been

fixed by agreement with any competitor. He is able to say that because the chances are that if it had been done in his company, he would have known it. That is his business. The prices have sometimes been fixed in a general way in consultation with their president. *No price has ever been suggested by the president, or anybody else, in any of these conferences, as a price agreed upon by any competitor.* The considerations that controlled him in these conferences, or when he acted independently of them in fixing prices, were competitive conditions and cost of manufacture. The state of their order book affects the question of prices. When the order book is lean, they probably make lower prices. When full of orders the chances are they will advance prices. That is always the case. It is observable that competition is keener and competitors more active when times are dull and order books are lean. Prices usually rule higher when business is active and when business is dull they rule lower. The prices obtained by them have fluctuated. He would say the prices obtained by their competitors have fluctuated. The trade or competition in these various articles manufactured has been nearly always active during the period. He has had charge of the sales. The competition has been what you would term keen. They met three or four or more competitors in every article they manufacture. The competitors are numerous. They have grown in numbers and output.

The testimony of the chairman of the Republic Iron & Steel Co. (vol. 26, p. 12019) shows how that large company arrives at its prices: they do not have uniform prices. They sell to some customers at one price and to other customers at another, varying with the size of the order, the quality and the character of the service they are expected to render, naturally. They have traveling men and their own branch sales offices. As a general rule, they send out to them prices at various times at which they are to sell their various products. They give minimum prices below which they shall not go, and allow them to use their intelligence in getting all above they can. That minimum would naturally be the same for all of them. Generally speaking, it would be the same based on cost. They give them the same latitude; in other words, the same general base, which represents a minimum below which they must not go, as it might involve a loss.

Methods of Selling

The general sales agent of the Lackawanna from 1905 to 1910, testifies (vol. 19, p. 7905) as to the competitive prices of that company, other than rails, to which special subject we refer later. He says that he had entire charge of the sale of the output of the company, making prices. Their market covered practically the entire United States. Their product was always sold in competition with the product of other manufacturers of steel. The competition was always keen and a great many times aggressive. The leading competitors were the mills of the Steel Corporation, the Carnegie Steel Co., the Jones & Laughlin Steel Co., the Inland Steel Co., the Cambria Steel Co., the Pennsylvania Steel Co., the Eastern Steel Co., the Carbon Steel Co., the Maryland Steel Co.; there were some others that he does not remember for the moment. In general, and in almost every case, he had the fixing of the prices. The prices were not fixed in agreement with competitors; always independently. That holds for the whole period of five years that he managed the sales. *There was no time during that period when the prices he either quoted or fixed were quoted or fixed in agreement with any of their competitors as to any article that they sold.* The prices were both uniform and variant. They might have been uniform on steel rails in some cases, and they might have been uniform on steel plates and shapes in some cases; but not necessarily so. They were following (referring to the uniformity on plates) at that time what they called the market price, and as a rule they tried to obtain the so-called market price. It was a matter of pride with a steel manufacturer to sell his goods at as high a price as that of any other manufacturer, and if the leading makers were getting $1.60, they felt it was up to them to get the same price, hence the uniformity of price. They were not always able to get the price they tried to get. They found some means of shading it. The extent of their order book or list was a great factor in making prices, the terms of payment and deliveries. If the mill was short of orders in any one line, special efforts were made to get business in that particular line, and in such cases, the seller is inclined to be rather more moderate in his demands, as to price, terms of payment, and all that. The prices varied considerably both ways during the period mentioned. That is true of everything except rails. When he went with the Lackawanna Steel Co. he found that the price of standard Bessemer steel rails was $28 a ton at the mill; it had been fixed for some time, he did not know how long a time. That price he adopted and never varied from it. It was tacitly understood that that was the price of their steel rails as fixed by the Lackawanna company. He testified that no statement (referring to conferences with the president on the prices of other products) was ever made in any of these conferences by the president of a price agreed on with competitors which would be adopted or maintained by the Lackawanna. He didn't recall any instance in which he was ever interfered with by an officer of the Lackawanna during the time he was there, in quoting such price as seemed best in his judgment to be warranted by business conditions. He don't recall any price ever named by him based on any other consideration than competitive business conditions.

As to the Jones & Laughlin competition, the testimony of the man in charge of the sales (vol. 20, p. 8029) is that Jones & Laughlin make steel billets, slabs and blooms, and convert these into finished products, principally structural material, plates, bars, shafting, chains, spikes, wire nails, tin plate and block sheets in tin mill sizes. These different products that they have are sold in competition with other makers of similar products. The competition is unlimited. He means unlimited by agreements as to prices. That is true of everything he has mentioned. *He says that this has been so to his knowledge for about nine years.* The competition has been keen. It extends to competition in the matter of prices.

Testimony of Mill Owners

From fellow competitive makers of the same general products as the Steel company, we naturally turn to the testimony of mill owners who use as their basic supplies the products made by these large companies, and inquire whether, as buyers, they have found any price fixation by these basic manufacturers. As a type of that character, we note the testimony of the president of such a company (vol. 20, p. 8050), who in substance says:

I should say we were using about 25,000 to 30,000 tons a year in 1901. It has been growing each year. I think last year we purchased something in the neighborhood of 100,000 tons. I know of no other single customer for bar mill products in the United States that buys as much as 100,000 tons. We buy from the Carnegie Steel, the Cambria Steel, the Republic Iron & Steel, the Youngstown Steel & Tube Co. and others. We have always found competition for our purchases of bars. Very keen, most generally. Of course, there are times in normal business when it is not so keen, times when the consumers of bars are competing to get them. We can generally purchase at a less price than the quotation; that is, the quotations published in *The Iron Age* or *The Iron Trade Review*. *I have never observed any indication of a combination or agreement among bar makers to fix prices.* We have always been able to buy on fair competition. I think we have always been able to get the benefit of fair competition.

The general manager of the next largest company of this character in the country (vol. 20, p. 7999), speaking of the purchases of his company, in substance says:

The competition is mainly between the Carnegie and the Republic. Price is one kind of that competition; the ability to handle our particular class of business and sufficient capacity on account of our enormous consumption of bars. We generally contract for our tonnage and we take bids on that contract. There is competition in the matter

Congratulations

By D. T. Croxton, President Cleveland Furnace Co., Cleveland.

The decision in the Steel Corporation suit should mark a big step in a new era of returning confidence to the business world.

Size is not illegal, therefore a corporation of large size—honestly, fairly and humanely managed—can exert an enormous influence for good and can be a bulwark of strength, to be emulated by smaller organizations.

I believe the whole country is to be congratulated on the outcome of that suit.

of price; in the matter of delivery, and to some extent, in quality. So far as we know or can find, there is no evidence of price fixing between the companies. We believe there is genuine competition for our business.

The president of a large boiler works and a purchaser of both plates and tubes (vol. 20, p. 8015) in substance says:

We receive quotations on plates from Lukens Iron & Steel Co., Worth Bros., Carnegie Steel Co., Cambria, Carbon and occasionally Allegheny Steel. They vary. There is a difference in the quotations from the different concerns. There is a range from one to three dollars a ton. We have never observed any evidence of a combinations to us. We feel we get the benefit of a genuine and unrestricted competition for our purchases.

The president of a large bolt and nut industry, the basis of which is rod and bar steel (vol. 20, p. 8042), says in substance:

We have been buying from the Carnegie Steel Co., Jones & Laughlin, and the Republic Steel & Iron Co. Before buying bars and rods, it is our custom to ask quotations from different makers. We buy two or three times in a year. The quotations on rods vary somewhat in price, about 50 cents a ton. They have been varying in that way to my knowledge since 1904. I never saw any evidence since 1904 of any combination to fix prices on our purchases. We have always got the benefit of competition on both of them.

The manager, since 1901, of the largest single gas company in the country (vol. 20, p. 8085) says in substance:

I am familiar with the purchases of iron and steel pipe made by that company since 1901. I decide which bidder shall be awarded the contract. During that period, we have got quotations from 13 different companies—there are 11 at the present time we get them from. We let our contracts and award our orders on the competitive basis all the time. The quotations vary and have done so ever since I have been connected with the company.

The president of a considerable tank manufacturing company (vol. 20, p. 8127) testifies as to competition for his purchases, saying in substance:

We buy from the Carnegie Steel Co., Cambria Steel Co., Jones & Laughlin, and have bought some from the Eastern Steel Co. and also from La Belle Iron Works. We find prices are nearly uniform from all companies in busy seasons, when the mills are busy. When the mills are not busy we get little concessions from most any of them, not to exceed $1.00 a ton, or something of that kind. I would consider it keen competition. I think we have had the benefit of genuine, aggressive competition for our business. We have had a range of prices—take three years past or for ten years—ranging from $1.10 to $1.50, and that, I think, is competition.

The same open competitive seeking after business of a steel spring company that buys for its basic supplies large quantities of steel bars and billets, is shown. Referring to the period from 1902 to 1913, its purchasing agent in substance, says:

We buy bars from the Carnegie Steel Co., the Inland Steel Co., the Cambria and the Pennsylvania. The quotations vary. There has been competition ever since I have been connected with my business. We buy billets from most anyone that sells—New York State Steel, Carnegie Steel, La Belle Iron Works, Portsmouth Steel, Inland Steel, the Bethlehem, the Pittsburgh Steel Co. and the Republic. The quotations we have received on billets varied very materially. That has been so ever since I was connected with it. So far as I have been able to tell, there has been competition in the billet business both as to price and on our part as to delivery. I certainly do think we have had the benefit of competition.

The president of a large coal mining company, which uses light rails, testifies (vol. 20, p. 8172) in substance:

As a rule we buy on a competitive basis. In Pennsylvania we get quotations from the Carnegie company, Jones & Laughlin, Cambria Steel, Pennsylvania Steel and Bethlehem. I should say that under normal conditions there is a range in the quotations all the way up to a dollar a ton. That is when business is normal. There are times when we cannot get quotations from many of those rail companies. That would be times of great prosperity in the steel business. The conditions have been such as I have described since 1901. So far as I know, we get the benefit of real and genuine competition in our purchases of light rails.

Fundamentally Sound

By George M. Verity, President American Rolling Mill Co., Middletown, O.

The decision that mere size is not an offense where an enterprise is ably and honestly managed, certainly appeals to us as not only fair and just, but fundamentally sound.

The evolution of the times has proven beyond the peradventure of a doubt that any nation that continues to do things in a small way is entirely out of the running. The nations of Europe with whom we must compete were quick to grasp that fact many years ago and as a consequence have encouraged and aided big business in order that they might reach out and bring home to their labor and capital the business of the world.

The president of a very large jobbing company in semi-finished steel products testifies in substance (vol. 20, p. 8176) as follows to the purchases being competitive:

I have been familiar with the business since 1899. We deal in billets and slabs, steel bars, bessemer iron, basic iron principally; malleable iron sometimes, some little foundry and coke. In the last ten years we have bought semi-finished steel from the Ashland Steel Co., the Portsmouth Steel, the Republic Iron & Steel Co., the Carnegie Steel Co., the Youngstown Sheet and Tube Co., the Allegheny Steel, the West Penn. Steel Co., the Cambria, LaBelle, Jones & Laughlin, Lackawanna and Pittsburgh Steel Co. We buy a competitive basis. It is competitive in a way. We know what the market is. We are not tied up to anybody. We buy outright and buy wherever we can buy the cheapest. There is a variation between the price as quoted at any particular time by the different manufacturers. It has always been so. There is competition in these products. It has always been so as far as I know.

The manager, since 1907, of a factory using various steel products, hoops, bands, angles, channels, sheets, wire goods, etc., which they bought from numerous companies, including the Carnegie Steel Co., shows that the competition and price ranges have been greater in steel than in other metal products. In substance he says (vol. 20, p. 8190):

The bids have not been uniform. On the contrary, they have varied. Since we commenced buying in 1907, there was nothing in the bids or offers or the transactions between us and the sellers that indicated any combination or arrangement between the various producers or sellers of the different class of steel products I have testified as to bring about a uniformity of price. The variations in the prices of steel as a rule, were greater than the variations in the prices quoted for us in copper, ingot copper, scrap copper, pig iron, scrap iron, tin, pig lead, antimony.

The president of one of the large hardware jobbing concerns in the country, buying large quantities of sheets and plates from several companies, including the Steel Corporation's subsidiaries, in substance, says (vol. 20, p. 8229):

During the last ten years, there seems to be a great deal of competition in sheets. There has not ben so much in the sale of tin plate, of course, as in sheets, because there are not so many in the business. With regard to sheets, the competition has manifested itself by a sharp solicitation of our business; and we could always get very low prices from what we might term the independents. The quotations on sheets during the last ten years have been variant. Anywhere from one to three dollars a ton. The quotations on tin plate have varied. The quotations on tubular goods are about the same as sheets, only not so much so. The competition in the sale of tubular goods has been keen among the different manufacturers.

Without quoting him at length, we may say the purchasing agent of one of the great eastern railway systems (vol. 21, p. 8568) shows that all the varied steel requirements of the road from a great terminal building to the spikes (with the exception of rail purchases, which were made by the president) were wholly in his control, and that there were constant variations in price and active competition for the railroad's purchases in all lines.

The purchasing agent for a western system (vol. 22, p. 9071) shows the same course of virile competition for its purchases.

A large jobber in tin plate, building sheets and other metals shows (vol. 22, p. 8943) that the jobbing trade is done on narrow margins and that active competition is vital. His purchases during the last 10 years were from different concerns, including the American Sheet & Tin Plate Co. He says, in substance:

There was, so far as I have seen, during the last ten years, competition. There has been competition in these products which I have

purchased between manufacturers. It has been of a very active character. They change their price quotations very frequently. It has been so during the whole period of ten years I spoke of. Sometimes a given concern would be higher and sometimes a given concern would be lower. Our purchases have been based upon the lower quotations. The competition in our jobbing trade has been very keen. The margin is very small. That necessitates our buying as close as possible. At the lowest quotation absolutely. We have done that. That explains our buying sometimes from one and sometimes from the other. That has been the case during the whole ten years.

Another jobber testifies (vol. 21, p. 8979) as to competitive conditions in wire during the last 10 years. His purchases included the American Steel & Wire and competing companies. He says, in substance:

There have been instances where the quotations we get from these concerns have agreed, but very rare; as a rule, they vary, what would be termed appreciably; oftentimes to the extent of 50 cents to $3.00 a ton. I never recall a time when two quotations continued for any length of time to be the same. I am speaking now of the whole period of ten years. I never observed anything to indicate a combination between these manufacturers on prices. There was always competition. They had inducements of some kind to offer in the way of price or delivery.

Keen for Competition

We have carefully and patiently studied the voluminous testimony bearing on the general course of all branches of the steel trade covering the whole time the Steel Corporation has been engaged in such trade. The testimony as noted above runs from volume 18 to volume 28, inclusive. It covers proofs by its manufacturing competitors in all branches, and also the different classes of customers the different classes of customers whose trade it and its fellow competitors seek. It is apparent that among this latter class, that is, the consumers of its products, we would naturally find evidence of any throttling of competition, or any undue restraint of the steel trade. The typical extracts we have made above from varied sorts of buyers of varied sorts of product cover wide ranges of consumers. No one can read these volumes of testimony and fail to be satisfied that this great body of business men, scattered over all parts of the country, in keen competition with each other in their several lines, is alert in seeing that competitive conditions exist between the manufacturers of basic steel products from whom they buy. And the sworn testimony of these men, who are vitally interested in the maintenance of real competition between the Steel Corporation and its manufacturing competitors, that such real competition does exist and has existed during the past 10 years, cannot but carry a conviction that such is the case. A study of the testimony of these men, who are close to and vitally interested observers of the prices of these products, shows that a single large concern, by lowering the price of any substantial steel product it sells, can depress the obtainable price. It further shows that the converse is not the case—that no single large concern, by raising or even maintaining the price of any substantial steel product, can raise the obtainable price. It further shows that the prices at which actual sales were made during this time in the steel trade depend on whether the consumption of steel was such that the mills were crowded with orders from buyers, or whether buyers were crowded with offers from mills. In other words, if the mills were crowded with orders, there was a keen increase of competition between buyers and a corresponding decrease in competition between manufacturers. On the other hand, if the mills were lacking in orders, then there was a keen competition between mill men to get orders and corresponding decrease in competition among buyers to give them. The proofs further show that when there is an increase of orders and a stiffening of prices, steel buyers are apt to buy at once, and this tends to further increase the price, but on the other hand, buyers are not apt (vol. 28, p. 11901) to buy at once when the price grows less, but wait until the bottom is reached, and this withholding of orders tends to accentuate the fall of prices. The proofs further show that in normal times, when ability to fill orders and ability to get orders are in fair balance, prices vary but little, but as soon as that balance is disturbed, the tendency of prices up or down becomes accentuated and increased competition follows, between the mills, if prices go down, between buyers, if they go up. The study of these proofs, given by both mill owners and buyers of their product, satisfy us that this has been and is the course of the steel trade, and we are therefore justified from the proofs in concluding that the prices at which steel products have been bought from the Steel company and its competitors, have been fixed by business conditions—over-demand or over-supply. The proofs also show (vol. 26, p. 11096) the same conditions and results prevail in the European steel market.

Many Pleased

New York, June 7. — A thick sheaf of telegrams and other personal messages has been accumulated in the office of Judge E. H. Gary representing a suggestion of the flood of congratulations over the successful issue of the government suit which has been pouring in upon the chairman of the Steel Corporation since the hour the decision first was made public. These messages of good will and evident satisfaction over the outcome have come from all sections of the country and from men in all lines of profession and business pursuit. Not a few of them have been received from the high officials of companies which are competitors of the Steel Corporation. All have revealed the unanimity of gratification and relief over the finding of the court as applied to large business enterprises and they leave no doubt that the decision has met with great popularity among the mass of business men and clear-thinking citizens generally.

Price Policy

Assuming, then, that the iron and steel trade in the United States is and has been, during the time here in question, flowing in the natural and normal channel of demand and supply, and of genuine competition, we next inquire as to what course the proofs show the Steel Company pursues in reference to such trade; in other words, is its course one of monopoly or in restraint of trade? Let us first ascertain what the practice of the Steel Corporation actually was and is as to prices. Whether that course be right or wrong; whether it be in violation of the letter or spirit of the Sherman Law, there can be no uncertainty in three things: First, what its policy is; second, of its having been openly and publicly avowed; and lastly, of its having been followed. Its avowed general practice in regard to prices is thus summarized (vol. 12, p. 4771) by its chairman, Judge Gary, who says:

The United States Steel Corporation has endeavored, so far as it could, to prevent the unreasonable increase of prices. It has been a decided factor from time to time in keeping prices down to a level which was believed to be fair and just. Prices generally are controlled very much by the business conditions of the country. The ordinary laws of trade and supply and demand fix the general prices of commodities, but the Steel Corporation has endeavored to prevent sudden and violent fluctuations downward by its advice, but more particularly by its own action in fixing its prices, and has endeavored to prevent the unreasonable increase in prices at times when the demand was greater than the supply, and there was a general disposition in the trade to take advantage of these conditions and unduly increase prices.

That it has followed this policy is the testimony of both its competitors and customers. Thus a manufacturer of agricultural implements, buying bars and plates both in bessemer and open hearth (vol. 20, p. 8314) says: "Our experience has been that on advancing markets the Carnegie company were as low and frequently lower than competitors, while on declining markets they were generally a little higher."

Another manufacturer, a buyer of structural shapes and other products (vol. 24, p. 9963), testifies that when prices are advancing the Carnegie company is the last one to advance and when they are declining it is the last one to decline. That this course has an absolute effect in steadying the market and that every manufacturer buying plain material and fabricating it, and being himself a bidder on work, prefers a steady market.

The president of the largest chain factory in the country (vol. 21, p. 8763), and who was a large buyer of rods and bars, testified that in his judgment the American Steel & Wire Co. has in several instances of boom times prevented a run-away market; that many times manufacturers in that line have told him that if it were not for the American Steel & Wire Co. the prices would advance, but that they could not get them to advance their prices.

A very considerable southern hard-

ware man (vol. 25, p. 10373) testified that in dull times the Steel company's prices were higher than its competitors and that it did not go to the low quotations its competitors did; that this had an effect in steadying prices; that this is a benefit to buyers in that it removes the speculative feature.

Another large southern hardware dealer (vol. 25, p. 10720) and other buyers (vol. 23, p. 9483) testify to the same effect. The testimony of competitors is to the same effect. Thus James A. Bowron, one of the leading southern manufacturers (vol. 25, p. 10427) testifies that they always knew what the prices of the Steel Company were; that they did not say their price was one thing and make it another; that their course was eminently conservative and the principal barrier against chaos. He testified that the Steel Company had stood in its own light in refusing to advance prices when in his judgment the market justified advances. He adds, "I think if I had been a stockholder in the Steel Corporation, I would have felt several times that it was failing to earn the money for me that it ought to have done by advancing prices." The fact of such policy and the reasons for it are thus summarized by Charles M. Schwab (vol. 11, p. 4157-8):

> While I was president of the Steel Corporation, I should say that our prices as a rule were somewhat above the other prices in depressed times and below the other prices in prosperous times. In other words, we endeavored to keep more uniform. * * * The theory was that many smaller dealers bought their steel from this corporation, that we did not want them to be speculators, nor did they want to be speculators, as it were, in the price of steel; that as a rule they were caught with big stocks when prices were high, and made heavy losers by reason of rapid reductions and the inclination to over-buy when prices were low; and if prices were kept nearly uniform, people buying steel would buy for their requirements and not speculatively.

The proofs also show—of which vol. 26, p. 11095; 11074; 11248; 10928, and may be cited as examples—that this policy, which is also followed by other large steel manufacturers, largely resulted in doing away with what are called delivery premiums, that is, of postponing deliveries of orders already taken at lower prices and giving the preference to orders taken later at higher prices, which higher prices were in effect obtained under the guise of so-called delivery premiums. The proofs likewise show that the lessening of extremes in the prices of basic steel products greatly benefits mills and factories that further fabricate such articles. Thus, vol. 21, p. 8847, one such witness testified:

> Of course, I am only a small manufacturer and perhaps to a certain extent typical of the average small consumer of steel products, but the conditions in the present decade are far more stable and far more favorable to intelligent manufacturing than they were in the previous period. Of course, the fluctuations have been less, and you can calculate on your road which you have to go over with a good deal more certainty. * * * The sudden fluctuations, rising and falling in prices, were very unfavorable to the maintenance of contracts, or to intelligent manufacturing. One could not buy and be sure that he could get out with a profit on account of the dips in the market.

The proofs show that the practical effects of this policy are that in prosperous times buyers are apt to buy from the Steel Corporation and in depressed times from its competitors. Whatever the wisdom or unwisdom of such a policy may be, we find no proof tending to show that it tends to monopolize the steel business or to unduly restrain trade, or to prejudice the public. There is no proof that it in any way interferes with the right of any other person in the steel business to fix his own price on his own steel product. The proof shows that the Steel Corporation in the exercise of its own business judgment has elected to publicly announce its prices, to adhere to them with all buyers alike, and to give timely notice of its purpose to change them. It is neither the duty nor the province of this court to express any opinion upon such policy unless we are satisfied, as laid down by the Supreme Court, "that it prejudices the public by unduly restricting competition or unduly obstructing the course of trade," and of this we have no proof. For, as we have seen, the testimony of those engaged in the steel trade is that this policy of the Steel Corporation in refusing to raise prices has not restricted competition or obstructed the course of trade, but, on the contrary, has tended to prevent prices from rising to what was aptly termed a "runaway market". And in this connection it is just to note that if the Steel Corporation in refusing to advance its own prices prevented other manufacturers from advancing theirs, it was only exercising a veto power (vol. 8, p. 3199; vol. 6, p. 2144), which every one of many other competitors possessed, and was following a policy which was also followed by other large competitors (vol. 6, p. 2108), who were also opposed to advancing prices. It is also just to say that in giving publicity to its prices, in adhering to them, and in giving timely notice of its purpose to change them, it will be seen on reflection that the Steel Corporation has adopted a policy of price publicity and adherence, somewhat analogous to the freight rate stability followed by the railroads under the directions of the interstate commerce commission, which publish their rates and only change them on notice.

When Prices Drop

We now turn to the other phases of this policy, viz., the Corporation refusing to sell at lower prices when prices dropped. That it did so, and that by reason thereof it lost business, which naturally went to those who did lower their prices, the proofs abundantly show. Of its right to refuse to sell at lower prices, provided it does not force others to do the same thing, there can be no question. This brings us to the question, what was the policy of the trade prior to 1901 under such conditions, what was its result and what evils are avoided by this change of policy?

In that regard the testimony leaves no doubt. We take the Carnegie Steel Co.'s course in the earlier steel period as illustrative, not only of its policy, but as fairly typifying that of its competitors as well. The cause of falling steel prices is, of course, that there are not enough orders to cover the production, and this leaves two courses open to the steel manufacturer: he must either shut down his mill or go after orders to keep it running. The policy of the Carnegie company—and in that respect it was the same as others—was to try to keep the mills going no matter what price they got for their product, or no matter whether their getting such orders meant the complete stoppage of their competitors' mills. Practically applied, this policy meant a fierce, ruthless price-cutting trade war, the practical results of which were that if these low prices enabled one company's mills to get the orders to run its mills, the taking of these orders from other companies' mills and other sections of the country shut them down. Thus in gov. ex. (vol. 11, p. 2479) we find a letter from Mr. Carnegie to the Carnegie Steel Co. embodied in its minutes, reciting such policy: "In the former depressions we announced our policy, viz., take all orders going and run full. Our competitors believed we meant what we said and this no doubt operated to clear the field. One after another dropped out; finally Pennsylvania Steel dropped out and only a few remained who could meet the lower price." In vol. 11, p. 4266, another letter of Mr. Carnegie to his company is given in evidence in which he says: "My view is that sooner or later Harrisburg (Pennsylvania Steel Co.), Sparrows Point (Maryland Steel Co.), and Scranton (predecessor of Lackawanna Steel Co.) will cease to make rails like Bethlehem (Bethlehem Steel Co.). The autumn of last year seemed as good time to force them out of business as any other. It did not prove so. The boom came and cost us a great deal of money."

The policy of taking orders, even without profit, was the destructive competition of that era. "To keep running" (gov't. ex. vol. 3, p. 1036), "not to make profit, is the point we should steer to", was the direction to the Carnegie Steel Co. "Take every order—otherwise we come to a stop, and only feed competitors who would close if we went to rock prices." Such being the policy, the proofs leave no doubt as to its effect. Mr. Schwab (vol. 11, p. 4191) testified that the destruction of the small and weak (competitors) was a practice not unknown in the old days. It was rather extensively carried on. It was at times with quite effective and marked results. That he did not know what percentage of them emerged from the steel wars in the old days. Not many. There were more grave stones than live competitors; that (p. 4155) they did everything they could to secure all the business they could secure, regardless of the price at which they secured it; that it was pretty hard on the competitors at times, but that was their policy, and one that it was very difficult to break away from.

Speaking of that policy, Judge Reed (vol. 14, p. 5671) says: "The policy of the Carnegie company was to go and get business, to take it wherever it could get it, and keep its mills running full, and run regardless of the feelings or prosperity of its competitors."

The result of the rail cutting prices,

as testified to by Walter Scranton, of the Scranton Iron & Steel Co. (vol. 8, p. 8), was that the price of rails was forced down to $14 a ton; that this was below the cost of manufacture; that as a result of this war his company was driven to abandon their mills at Scranton and that wages were forced down to the lowest they had been for years. And as a practical example of this era of trade war competition and ruinous price cutting, we have the testimony of Frank S. Witherbee, who, referring to the Troy Steel & Iron Co. (vol. 18, p. 7296), says: "The Carnegie Steel Co. drove that company out of business; it drove it out of existence, not by the use of the ores; I think the cost of pig iron was lower at Troy than it was at Pittsburgh; it drove it out of the business by its policy of going to our customers and telling them to get the best price they could from us and they would name 50 cents a ton lower."

Days of Ruinous Wars

Referring to one of these ruinous trade wars between two large steel companies, Powell Stackhouse, president of the Cambria Steel Co., which was not one of the participants, testified (vol. 4, p. 1706):

Q. How nearly can you fix the time of what you call the Gates and Carnegie row?

A. That was somewhere in the 90's; in the latter part of the 90's.

Q. About 1897, or somewhere along there?

A. Somewhere along there; from 1895. I would not be sure of that.

Q. And that was followed, I judge, from what you say, by rather a fierce trade war, lasting a year or two?

A. Yes; in all lines of steel.

Q. In all lines of steel?

A. Yes, everything. As the result of that, there was the keenest competition, and steel was sold, bar steel, at, I think, less than nine-tenths of a cent.

Q. And it cost more than that to make it?

A. Yes; a good bit more.

Q. And the consequence of this was very serious to the trade, was it not?

A. It was serious to everybody in the trade. It was very serious, for instance, to the warehouse men that had some thousand or more tons of steel, or whatever they might have on hand. Their stocks were probably reduced from one to two cents a pound way down.

Q. That warfare left a trail of ruin?

A. Yes, it did.

Q. And there were a great many failures on account of it?

A. Yes.

Q. And general business disaster?

A. General depression.

Q. And business disaster?

A. Yes, sir.

Q. And failure and bankruptcy?

A. Yes, sir.

Q. (Continuing). Were the direct effects of it, were they not?

A. Yes.

Q. You had had trade wars before, I suppose, had you not?

A. Yes.

Q. But none so severe as this?

A. None so severe as that.

Q. But they were always attended with injury to the business, and especially to the warehousemen or middlemen, were they not?

A. Yes, sir. The middleman had bought and had his material on hand and, overnight, by the price falling a few dollars a ton—

Q. (Interposing) He was ruined?

A. He was ruined, in some cases. Some of them carried very large stocks.

Q. The effect, I suppose, of such warfare, and particularly the Gates and Carnegie warfares, was felt mostly by the weaker concerns in the business?

A. We all felt it.

Q. You all felt it, but the stronger ones weather it?

A. Certainly.

Q. And the weaker ones all went to the wall?

A. They were weakened so that they gradually dropped out.

Q. They gradually dropped out?

A. Yes, sir.

Q. So the effect of that was not confined to the manufacturers, but was felt even more by the warehousemen and jobbers, was it not?

A. Yes. They could measure their loss at once. If they knew what their inventory was and the difference between what they paid and what prices had fallen to, they could measure their loss at once.

Q. What about the retailers? What was the effect on them?

A. The same thing. Anybody that carried a stock of steel or iron on hand, if the value of that stock was reduced $5 or $10 a ton, just simply had to write off that amount.

Bitter, Fierce, Destructive

Indeed, the general competitive policies of the steel companies toward each other is well summarized—and this summary is justified by the proofs—by the chairman of the Steel Corporation who (vol. 12, p. 4777) says:

On the other hand, in older days, the rule in this country was different in this line of business. I have no doubt the suggestion of Mr. Carnegie, which was read in court a few days since when I was present, represented not only his views, but the views of his associates and the views generally held amongst those who were in charge of the iron and steel industry of this country. There was a competition that was bitter, fierce, destructive. If it did not absolutely drive competitors out of business, it so harassed and injured them as to prevent them from extending their business, or from taking advantage of their location, and at times compelled them to close their mills, discharge their employes and disrupt their organization; and, in fact, was a competition that, in the opinion of those in charge of the United States Steel Corporation, I might say the opinion of those in control of the industry generally in this country at the present time, was calculated to destroy, to injure, instead of build up; to prevent extensions of trade, to limit the capacity or the opportunity of many who were engaged in the trade.

Bacon on Gary

In that connection and in corroboration of what the chairman says, the testimony of others (Reed, vol. 14, p. 5692; Roberts, vol. 13, p. 4997; Farrell, vol. 10, p. 4058) should be noted. This is summarized by Robert Bacon, who (vol. 14, p. 5494) says:

The facts are that the policy of the company from the beginning has been to change the old method of dealing with competitors. Judge Gary, who has done more for the United States Steel Corporation in its development and the benefits it has brought all hands, than any one man since its formation, has made it a cardinal point of his policy, and has tried his best to inculcate it upon all the sub-companies, that there was a new order of things, that there were new rules of the game in dealing with competitors, as well as in other human relations. Judge Gary has talked from the very first and has tried to compel the actions of all the others in the corporation toward dealing fairly and decently with competitors, as being the only way in which any kind of stability in prices or of conditions could be maintained. He has, from the beginning preached and practiced the fairest kind of dealing with his competitors, keeping them informed as far as he legitimately could, of all the conditions of the Steel Corporation, and by doing so has gradually acquired a degree of confidence that in my opinion has never existed before amongst competitors. The old conditions have changed; the old destructive and ruinous and ruthless warfare of the early days of the iron and steel industry has disappeared, and in its place, by reason of the attitude of Judge Gary, more than anyone else, a condition has been produced among competitors in the iron and steel business and, I believe, in many other industries, that never before existed.

And in that connection it should be noted that no testimony has been produced in this record that a return to the old trade war system of ruinous competition would, as a matter of fact, benefit the public interests. On the contrary, the proof is that present business methods and ethics are more to be desired. As expressive of the view of those in the steel business, who are not connected with the Steel Corporation, we may note the testimony of the president of one of the largest steel castings company in the country, who (vol. 20, p. 8067) says:

Before the formation of the Steel Corporation, business ethics, I might say, were in very bad shape, competitors had no confidence in each other; they resorted to subterfuge, misrepresentations and false statements. That same lack of confidence existed between sellers and many purchasing agents. It was a very undesirable condition in which to do business. For the past seven or ten years—in later times at any rate—all that misunderstanding or misgiving has been displaced by manly, straightforward dealing. I do not think it could have been brought about without the Steel Corporation's influence and example. The benefit of that example has extended into collateral industries like ours. I have noticed an improvement in the competition of our own business in an ethical way. We still have the competition, but we do not try to misrepresent or tell lies any more. We are honestly friends now. Then we pretended to be friends, but were the bitterest enemies. It appears to be an improvement that pervades the entire steel line; and being the largest unit, the most influential unit, and setting a commendable example, has led us to all realize that it is a betterment.

More General Division

A study of these proofs satisfies us that apart from all ethical questions, the strong trend of the steel business at the close of the last century was toward driving competitors out of business by cutting prices, and that the business policy inaugurated by the Steel Corporation (vol. 14, p. 5670-3; vol. 13, p. 5218; vol. 12, p. 4777; vol. 14, p. 5717), and in which policy its competitors subsequently followed, has resulted, in the 10 years of its existence, first, in a more general division of business between all competitors in

the steel business than under the older system. Second, in tending to minimize the shutting down of its own and its competitors' plants in times of depression. Third, it has made steel products non-speculative and has therefore benefited all dependent iron and steel manufacturers by enabling them to have a steady, non-speculative supply of those basic steel products on which their plants depend for operation. The evidence on which these conclusions are based is corroborated by the business facts and business results in which we now summarize in the working out of this policy for 10 years by the Steel Corporation and its competitors. During that time the business of both competitors and the Steel company has increased very largely, but it is highly suggestive, indeed, conclusive proof that the Steel company had neither monopolistic control nor power to restrain trade, since the proportion of trade increase was very materially greater on the part of the Steel Corporation's competitors than its own. These significant figures prove that mere size, or bigness of business, is not necessarily a monopoly of business at the expense of all others engaged in it. And in that connection, and as aptly expressive of our views, we may quote with approval the language of Judge Hook, of the Eighth Circuit, in his concurring opinion in the Standard Oil case, 173 Fed. Rep. 196:

> Success and magnitude of business, the rewards of fair and honorable endeavor, were not among the evils which threatened the public welfare and attracted the attention of congress, but when they had been attained by wrongful and unlawful methods, and competition had been crippled or destroyed, the elements of monopoly are present.

Conclusions as to United States

In the most important element of steel rails, an item on which great stress has been laid, a most important factor of monopoly, and control of prices, we find that, in spite of the general increase of rail production, the Steel Corporation's relative proportion of rail business has fallen off nearly 8 per cent, while its competitors' has increased correspondingly. In the great basic item of steel ingots, on which the great bulk of steel manufacturing rests, while the Steel Company's ingot business increased 44 per cent, its competitors ingot business grew nearly three times as fast, viz., 137 per cent. To say that any monopoly of ingots existed when this bill was filed, that it now exists, or that it can exist, is simply to run counter to the testimony of ten years' business experience, and to the evidence in this record. In the great item of structural shapes, which enter into bridges, buildings, and other common uses, while the business of the Steel Company in these years increased nearly one-half, to be exact, 42.7 per cent, its competitors have, during these years, gone ahead nearly four times as fast, 164.4 per cent, and in that connection, it will be observed, as heretofore shown, that a large part of the increase of the Steel Company's structural product was in the foreign, not in the home market, in which latter market it has more than 300 fabricating competitors. Practically the same proportions exist in wire rods, the basis of wire fences and other articles of wide-spread use. In wire rods, the Steel Corporation has increased its business 49.7 per cent; its competitors 182.2 per cent, nearly four times as fast. So also a monopoly of the tin plate industry was feared, while the outcome shows the Steel Corporation has in tin plate and terne plate increased 63 per cent; its competitors have increased threefold as fast, viz., 186 per cent. So in the pipe industry. Instead of there being a monopolistic and exclusive growth, there has been a relative retrogression, for while the pipe business of the Steel Corporation has largely increased—in wrought pipe 36 per cent and in seamless tubes 100 per cent—its competitors have increased nearly six times as fast—in wrought pipe 209.9 per cent, and in seamless tubes over seven times as fast, 750 per cent. In the item of pipe alone, it has already been noted in the testimony of the general manager of a great gas company, that, as a buyer of pipe, it enjoys active competition between 13 concerns.

These facts and figures conclusively answer the charges of monopoly and restraint in the home market. We are therefore justified in answering in the negative the question to which the foregoing part of this opinion is addressed, namely,—was the United States Steel Corporation, at the time this bill was filed, then prejudicing the public interest by unduly obstructing the steel and iron business of the United States?

Foreign Trade

We turn next to the steel and iron trade with foreign nations, and address ourselves to the second question, namely, was the United States Steel Corporation, at the time this bill was filed, then prejudicing the public interest by unduly restricting or unduly obstructing the steel and iron business with foreign nations?

In taking up that question, it is to be noted that the entire foreign business here in question is now carried on, not by the Steel Corporation, but by a subsidiary of the Federal Steel Co. (vol. 10, p. 3775) called the Steel Products Co. This company was formed in 1903, and the Federal Steel Co. is the owner of its stock. This Products company is not made a party to this bill and there is no prayer for its dissolution. All other subsidiary companies of the Steel Corporation are made parties and their dissolution in many cases prayed for. Whether the omission of the Products company from the bill, and the absence of any prayer for its dissolution, was an omission, or was advisedly done, with the purpose of conserving its foreign trade, does not appear. But the absence of a formal prayer for the dissolution of the Products company is, however, of no practical importance, for the continuance of such foreign trade of the Products company is manifestly dependent on the manufacturing facilities, the product diversity, and the financial ability of the Steel Corporation. If, therefore, the Steel Corporation be dissolved by this court, the Products company will be divested of the practical commercial power of continuing its foreign trade, since the proof is, (vol. 10, p. 3844-3879) that 80 per cent of the goods it sells necessarily (vol. 6, p. 2215; vol. 12, p. 4731) comes from the Pittsburgh district in which the Federal company has but little production. On the other hand, if the Federal company be also dissolved, then the Products company will of course be left without any mills or plants which are so located (vol. 10, p. 3829) as to do export business, but 2 per cent of the Federal Steel Co.'s product now going (vol. 10, p. 3829) into foreign trade. So that the foreign trade of the Products company, if acquired and held in violation of the Sherman law, can be as effectually ended by a dissolution of the Steel Corporation or the Federal Steel Co., as though the Products company had been made a party to this proceeding and its dissolution prayed for and decreed.

It is apparent that the monopolization and restraint of foreign trade must in the nature of things consist of either taking away from others a foreign trade which already existed, or if such foreign trade was not in existence, then in building up or maintaining such foreign trade by preventing or restraining others from entering it.

A Concrete Proposition

Now foreign trade is not a mere general, theoretical obstruction of selling abroad, but is a concrete, definite, business proposition in iron and steel. We have our domestic trade which consists in supplying domestic use or consumption. And such domestic use necessitates one having or taking to the market where his customer is located the articles the latter wants to buy. It goes without saying that if one man has a wire mill at Pittsburgh, situate near another man's billet mill, and that billet mill has in its warehouse at all times an ample supply of billets to run the wire mill (the proofs (vol. 10, p. 3773) show 18 different analyses of such billets are required), the wire mill owner will prefer to deal with, and will deal with, the billet mill in Pittsburgh in preference to dealing with one at Chicago. And this is so, because freights are eliminated (vol. 10, p. 3987); uncertainties of railroad transportation are avoided; if materials prove faulty or not of the right metallic character (vol. 10, p. 3773) the mischief can be at once remedied. Of course, if the Chicago mill, from any motive, chooses either from over-production, business needs, or other causes, to offer the wire mills at Pittsburgh billets at a lower price than the Pittsburgh mill, a sale might be made; but this occasional, abnormal purchase could and would result in no established, normal trade between the Chicago billet mill and the Pennsylvania wire mill. The only way such normal trade relation could be established would be by the Chicago manufacturer locating a permanent, stock warehouse near the Pittsburgh wire mill.

Effect of Tariffs

If its cost of production was so low and it could pay the freight from Chicago to Pennsylvania, and could furnish in quality, quantity and price the same product as the Pittsburgh mill, then and then only, could it hope to have normal, continuous trade with the Pittsburgh wire mill. We take this homely but suggestive illustration to emphasize what the proofs show are the demands and requirements in foreign iron and steel markets which confront an attempt to enter them, and that such market is not to be held by the mere occasional shipping of goods to foreign countries. Moreover,

in considering the possible range of foreign iron and steel markets for American iron and steel, there must first be excluded from that market Germany, France, Austria, Italy and Russia. The proof is (vol. 10, p. 3846-7) that the tariffs of each of those countries prevent the sale there of American iron and steel. The proofs also show (vol. 10, p. 3827-3849) that the attitude of the English public and the hostility of English labor organizations toward American iron and steel likewise prevent American iron and steel products entering England, save wire fences, the manufacture of which is only now being taken up there. It follows, therefore, that the iron and steel trade of the United States with foreign nations must be largely built up in other parts of the world, and such has been the outcome of the efforts of this company as shown by the proofs. Referring to trade in such nations as are not closed to the iron and steel business by their tariffs, these in a general way are the steel markets of Asia, Africa, the British colonies, all South America, Cuba and Mexico. But while these markets are open, they were, when the Steel Corporation was formed (vol. 10, p. 4125), "practically pre-empted by foreign manufacturers and foreign merchants; that is, principally continental concerns, English concerns, as well as having branch offices and warehouses in all of the consuming markets of the world. It was a very difficult thing to enter those markets. The European manufacturers had been established in the markets of South America, Asia, Africa and the Orient, some of them over 50 years. There was not only a prejudice, but a hostility in most cases against newcomers in the trade. In order to get a foothold in these markets, we usually had to sell below the prices of the concerns that were established there, and who had their customers and native salesmen, and all the advantages that go with a long occupation of a business in any foreign country. It is more the custom in foreign countries than it is here for people to attach to themselves customers that buy form them regularly". Moreover, the proofs (vol. 10, p. 3842) show, and such would seem to be the manifest commercial fact that, "It is impossible to develop a foreign business unless it is done continuously. Buyers will not patronize people who are not in a position to give them a continuous source of supply." Without entering upon a discussion of other matters, it suffices to say that not only were these foreign markets pre-empted and tenaciously held by foreign manufacturers, foreign merchants and foreign bankers who refused to finance importing enterprises there unless there was (vol. 10, p. 3833) a stipulation that all materials should be bought in such bank's own country, but the markets required the maintenance of varied lines of products, the only way to supply which varied lines was by having varied lines of finishing mills at home and the maintenance of large warehouses (vol. 13, p. 4974; vol. 11, p. 4150) abroad. The proofs in the case show that in 1901, when the Steel Company was formed, with the exception of wire exportations—which for various reasons (vol. 10, p. 3792-3790-3791) was not broadly successful—there was no iron and steel trade of an established or continuous character between American iron and steel manufacturers and foreign nations. It is true there were spasmodic exports which at times amounted to considerable volume, but they were not continuous or sustained and they resulted in no established trade or dealing. Indeed in many cases the nature of this spasmodic trade (vol. 10, p. 3842) was such as to create a hostile feeling toward any subsequent effort on the part of American iron and steel trade to enter the same foreign market. The proofs show that, at that time and for many years previous, so long as the demands of the home market was sufficient to absorb their product, our iron and steel manufacturers made no effort to sell their output abroad. When, however, the reverse was the case, and they had on hand a surplus product for which there was no domestic trade, they went into the foreign market and tried to get rid of such surplus product there. The European and American steel and iron market being inter-related (vol. 28, p. 12013), the proof is that in addition to paying the freight to get his goods to the foreign market, the American manufacturer had, in order to get customers away from the foreign manufacturers who were already in possession of such trade, to cut the price when they sold in the foreign market. This spasmodic course grew to be known in the steel business as "dumping" (vol. 10, p. 3843, 3846 and 3993), and may be well likened to the bargain sales by which a merchant seeks to dispose of a surplus stock which he cannot sell at normal prices. It will, of course, be obvious that a manufacturer could not continue such low price dumping, any more than a merchant could dispose of all of his stock—instead of his surplus stock—at bargain prices. The proofs (vol. 26, p. 11096) show the same course of dumping abroad in times of depressed markets was followed by European steel manufacturers in our market. The then status of American steel manufacturers is shown by the proven experience of the Carnegie Steel Co. It was the most aggressive of any of the steel companies to enter foreign trade, exporting 70 per cent of the then steel exports (vol. 11, p. 4345). The Carnegie company's location, facilities and freight rates enabled it better than most other companies, to enter foreign trade, and from its works, as the foreign trade of the Steel Corporation developed, such trade to the extent of (vol. 10, p. 3845) 24 per cent of the entire product of the Carnegie company goes into such export trade. It will, therefore, appear that the Carnegie company can be fairly regarded as the best fitted of American steel companies to compete for export trade. Referring to that time, the president of that company (vol. 11, p. 4139) testified:

> We had made spasmodic attempts at it. In dull times, when business could not be secured at home, we could make attempts at foreign business by going in and making an unusual price, which was the only way that any foreign business could be secured then, inasmuch as we had not an established business or business connection, and therefore, customers were not inclined to buy from a firm who could only furnish them occasionally.

The relation of the Carnegie company to foreign trade is shown by its minutes, etc., as they appear in government exhibit, vol. 3, p. 1134. From the proofs in the case, these things seem settled, namely, that when the Steel Corporation was formed, American steel manufacturers had no real, dependable, export trade abroad; that such sales as they made were spasmodic, made with a view to dumping surplus product, and such sales were secured by underselling the European market when they had no home market. It will also appear that being excluded by the steel tariffs of Germany, France, Russia, Austria and Italy, and by other causes from England, such dependable foreign markets as were open for them to build up, as will be seen later, had to be found in other parts of the world. This summary of the situation is warranted by the study of the proofs.*

Developing Trade

Seeing, then, that when the Steel Corporation was formed no such volume of foreign trade in steel existed, that the acquisition of any part, or indeed the whole of it, could constitute a restraint of trade with other countries, and seeing that the foreign trade which the Steel Corporation had

*We may add that, wholly apart from the record, a reading by us of books, articles and addresses on the subject of foreign trade, satisfies us that the evidence of those who have in this record testified on the subject is in harmony with the views expressed in current literature of the steel trade. From that reading, we have selected as expressive of the then attitude of the American steel trade toward the foreign market, an article by James M. Swank (whose reports of statistics, deft's. ex. vol. 3, p. 145, have been received by all parties to this record as reliable). In an article on The Future of the American Iron Trade, in the *Engineering Magazine* of 1895, vol. 10, p. 613, Mr. Swank says:

"Except in periods of excitement, like that which prevailed last summer, our capacity for the production of iron and steel will be greater than the home demand. This fact, joined to the cheapening of all iron and steel products through competition, has led many of our manufacturers to look to foreign markets to absorb our surplus products, or to employ our surplus capacity. An examination of our export statistics for many years shows that this is a delusive hope."

Mr. Swank then takes up our iron and steel exports for many years. He shows that during the 15 years following 1870, there was no progress whatever. That during the next six years it increased rapidly, when a decline began, followed the next year by a slight increase. He called attention to the fact that, included in our iron and steel exports, have been a number of things, such as machinery, boilers, hardware, sewing machines, saws, tools, locomotives, etc., which formed the principal part of our iron and steel exports. That out of $30,000,000 in the aggregate of such exports, less than $400,000 was pig iron; that plates and sheets were less than $200,000; that nails only amounted to $500,000, and iron and steel rails about the same amount, ending with this statement—"the other products of our rolling mills and steel works forming an infinitessimal part." He then says:

"It is evident that our iron and steel manufacturers, as contra-distinguished from the manufacturers of machinery, hardware, saws, tools, sewing machines, locomotives, and other finished articles, have little to hope for in foreign markets under present conditions, or those which have recently prevailed."

The conclusion of his whole article is this:

"It follows from what has been said that American iron and steel manufacturers must look almost entirely to their own country for the employment of the productive capacity of their iron and steel works, and that if this capacity cannot be properly utilized, some of it, as in the past, must stand idle or be abandoned. The fittest works will survive. For these there will be sufficient employment."

during its earlier years has increased from approximately thirty-one millions to ninety-one millions, we turn to the next question, did the Steel company acquire this original or additional trade by monopolizing or restraining foreign trade, or attempting to do so; or, on the other hand, was its acquisition the natural and normal growth of fair business effort? We have said the foreign trade of the Steel company in 1911 was $91,000,000, but of that amount some thirty millions is really not solely its own, but was shared by it with other American steel manufacturers. To explain, it will hereafter appear that in the development of a foreign steel trade, the Steel Corporation has established agencies, warehouses, freight communications and other exporting agencies in many of the markets of the world. As we read the testimony (vol. 11, p. 4472, 4471) in reference to this thirty millions of foreign trade, it seems that if an American manufacturer of steel finished products, for example, locomotives, oil tanks, gas tanks, cars, etc., had an inquiry or desired to make a bid to furnish such goods in some foreign country, where such manufacturer did not have, but the Steel Corporation did have, a representative, the Steel Corporation would on request ascertain and report to the American tank manufacturer what price he would have to put on his tanks, etc., to get into the desired foreign market. The ability of the tank maker to meet such foreign competitive price in the prospective buyer's market, depended, amongst other things, on two items,—the cost of the sheets from which his tank was made and the freight cost of delivering the tank. In case the current prices of such sheets in the American steel market were such that the tank maker could not sell his tank low enough to compete with the foreign bidder, the Steel Corporation would agree to furnish the plates at such lower price as would enable the tank maker to underbid his foreign competitor. This price reduction, coupled with the fact that the Steel Corporation would forward the tanks with its own freight, enabled the tank maker and the Steel Corporation to thus jointly sell the tank which neither could do alone. By such operations, where it made the basic material, but did not make the finished article, the Steel Corporation, in 1911, thus did $30,000,000 in trade abroad in finished steel products in co-operation with other American manufacturers. The proofs show that this course of price reduction was followed in order to induce American manufacturers of finished steel products to co-operate with the Steel Corporation in extending the latter's foreign trade. The uncontradicted proof in that regard is that these foreign reduction prices, thus given to American manufacturers to enable them to compete in the foreign markets, were open (vol. 11, p. 4472) "To all consumers, anybody that wanted to develop a foreign business received our assistance, not only in the way of special prices, but we would lend him a salesman in a foreign country and place our office at his disposal and help him in every way to build up a foreign business. * * * (vol. 10, p. 3835.) Our office is an encyclopedia for the manufacturers of the United States, particularly in iron and steel and those collateral lines. We have never hesitated to give information with regard to conditions in countries, and the credit of people whom we may have been doing business with, and especially facilities and information generally with regard to tariffs in countries and railway facilities for internal distribution generally. * * * (vol. 10, p. 3836.) I had prepared under my direction a list, I think, of about 158 manufacturers to whom we have made a special allowance in order to enable them to develop a foreign business." The proofs (vol. 10, p. 3848) that this large volume of business, termed by the Steel company "re-export" business, and amounting, as stated, to $30,000,000 in 1911, was shared in by 158 other firms or companies, and in making such re-export articles from 15,000 to 18,000 men were employed. The proof is (vol. 10, p. 3885) that on ocean freights the Steel Corporation has no rebate or advantage over its competitors. It will be observed that in thus reducing the price of basic steel materials to enable manufacturers to enter the foreign markets, the Steel Corporation has pursued the same helpful course of lower freights for exports, which the interstate commerce commission has, since 1903, approved of the railroads doing. In that regard the proofs show (vol. 11, pp. 4474-5).

> If a shipment is made from Pittsburgh to New York under a bill of lading beginning and ending with Pittsburgh and New York, that where it is known that it is going to be exported the rate is less than when it is known it is going to stop in New York; the tariffs are published * * * *. There is an export rate and a domestic rate, and the government has encouraged the export business to the extent of permitting the interstate commerce commission to make export rates. The export rates have been in effect since 1903.

And we may add the proofs (vol. 10, p. 3833) show that the interstate commerce commission has gone to the extent of differentiating among different articles for export, making freights on export rails lower than on other export articles. We may here say that the interstate commerce commission and the railroads in thus co-operating with the Steel Corporation and these other manufacturers in allowing lower freights from interior points to the seaboard on goods intended for export, has followed the policy adopted in European countries. In that regard the proofs (vol. 12, p. 12037) show: "The German government and the German railroads help for the export of finished products, but they charge the full domestic rate for any finished product that is imported."

Not a Question of Figures

Passing on, then, from this $30,000,000 of the foreign trade,. which the Steel company has created for itself by inducing domestic consumers of its basic products to jointly enter into a foreign trade and considering the other foreign trade $60,000,000 which is its own, we examine the evidence as to whether the creation and building up of this, its own foreign trade, involves monopoly or restraint of trade. This becomes all-important, because the Steel Corporation's contention is that the creation and building up of a foreign steel and iron trade was one of the controlling reasons that led to its formation, and not a purpose to restrain or monopolize interstate home trade. In that regard the contention of the Steel Corporation is that no such foreign steel and iron trade could be built up without the large resources of the Steel company (vol. 10, p. 3790-1), and the varied products which the integration and combination of its units alone made possible. The mere statement of this contention shows its importance, for if the two-fold purpose of this statute is to foster and protect trade, both foreign and interstate, and if foreign trade cannot be increased without some such mechanically varied and financially strong agency as this Steel Corporation, then manifestly such agency is not a violation of a statute whose purpose was to permit—not to prevent—the normal, natural and to-be-desired development of unrestrained, unmonopolized trade, both foreign and domestic. In taking up this question, we dismiss once and for all the question of mere volume or bigness of business, whether big or little, done—was it, in the test of the Supreme Court, done by prejudicing the public interests, by unduly restricting or unduly obstructing trade? The question is one of undue restriction or obstruction of trade, and not of undue volume of trade. If mere size were the test of monopoly and trade restraint, we have not one, but a half dozen unlawful monopolies in the large department stores of a single city. If a manufacturing and selling business, fully equipped for its local market, extends its operations to cover a state, its business, its facilities, its capital, must grow larger. If it is to cover nations, it must be larger still. These plain facts simply buttress the holdings by courts that the normal and necessary expansion of business to any size is not forbidden by the Sherman law, unless such expansion is accompanied or accomplished by an undue restraint or obstruction of trade. For, as said by Mr. Justice Day in Flint v. Stout, 220 U. S. 166:

> The possession of large assets is a business advantage of great value; it may give credit which will result in more economical business methods; it may give a standing which shall facilitate purchases; it may enable the corporation to enlarge the field of its activities and in many ways give it business standing and prestige.

Turning, then, to this foreign trade, we find that in 1901 the Steel Corporation did a foreign trade of $31,000,000, and in 1911 of $91,000,000. This (vol. 10, p. 3847) was 90 per cent of the foreign iron and steel trade of the country. On the one hand, it is charged that this foreign trade was acquired by violation of the Sherman Act; on the other, that it is the normal and natural result of lawful business, commercial foresight and persistent effort. To determine these contentions from the evidence, we now address ourselves. Of the purpose of this Corporation to create and possess this foreign trade there can be no question. So that if it was illegally done, the company cannot escape the legal consequences. Its avowed purpose to enter into and acquire foreign trade in iron and steel is shown by the Corporation's own proofs (Gary, vol. 12,

p. 4733; Reed, vol. 14, pp. 5658, 5562, 5563; Bacon, vol. 14, p. 5476). Indeed, in outlining the plan and scope of the operations of the Steel company, whose formation he was then advocating, its first president (Schwab, vol. 11, p. 4239) says:

I enlarged and perhaps made a more strenuous talk to Mr. Morgan upon the subject of export, and our ability to export, and foreign business in foreign markets, than any other, excepting only the economic advantages to be derived.

Indeed, that the Steel Corporation was largely formed, that its large financial resources were designed and the varied lines its constituent manufacturing units were brought to enable it to successfully enter foreign trade is shown by the proofs. Thus (vol. 11, p. 4321), referring to his talk with Mr. Morgan, Mr. Schwab says:

I expected, naturally, to increase the foreign trade very much. May I explain what I mean by my development of foreign trade? I said before that this business could only be practically and successfully developed by works having a complete line of steel products; and that was one of the things to be gained by this organization.

Q. And in taking this up with Mr. Morgan you presented that?

A. That was one of the things I urged.

The fact that the development of the foreign trade necessitated a wide diversity of products; that this product diversity was to be obtained by the Federal Steel Co. acquiring a number of mills making such diversity of products and completely integrating itself, is shown by the proofs. Referring to carrying out the general plans which he and Mr. Morgan outlined for acquiring such properties, Judge Gary (vol. 12, p. 4733) testified:

Q. Now, what were the subjects considered by you gentlemen, directors of the Federal company, or owners of the Federal, at that time, and on account of which, or after considering which, you reached the resolution you mention?

A. The question of securing the Carnegie properties, with their ore reserves, which contained a class and character of ore in large quantities which the Federal or the Minnesota Iron did not have, particularly their mills for diversified products, their location and their organization, which was believed to be a very good one, and if possible, the acquisition of other companies owning finishing mills, in order to diversify the product, including the Wire company, which had been offered to us a number of times, and for the purpose, as I have said, of completing a rounded-out proposition, for the development of the business, extension of the business, manufacturing at lowest cost, and, particularly, increasing the extent of export business.

And that such foreign trade demanded such wide diversity of product as could only be supplied by a company which was broadly integrated to manufacture such diversified supplies is shown by the proofs. In that regard a witness of long experience in foreign trade (Farrell, vol. 10, p. 3790) says:

Q. What is the nature of your customers in foreign countries? Do you sell merchants or directly to consumers, or both?

A. We sell to merchants, consumers and manufacturers.

Q. Is there any advantage in selling to merchants to have a diversified line of products?

A. A great advantage. That is the reason why we have been able to develop our business, because we offer them a diversified line of products from one source.

Q. From your knowledge of the business and the way it is done, what would you say as to whether or not the different constituent members of the Steel Corporation could all together have developed such a foreign trade as has been developed by the Corporation, if they had remained separate and distinct?

A. It would have been utterly impracticable and impossible. We had no exemplification of that in the Pittsburgh Wire Co., where we were obliged to confine our exports to two or three different products, because of the necessity of having facilities to deal with certain lines of business.

Q. Take, for instance, the American Steel & Wire Co., as an economic proposition, as a business proposition; will you state whether or not it would have been feasible or possible for the American Steel & Wire Co. to maintain agencies in the various countries, as stated in exhibit 39?

A. It would have been impossible owing to the cost.

Q. What would be the fact as to the Carnegie Steel Co. in all these countries?

A. The same thing would apply to the Carnegie Steel Co., even to a greater extent because of the character of their product, which is not as widely consumed as wire products and sheet steel products, except in the case of some coarse products.

Q. What influence, if any, does the offering of one class of steel products have on the sale of another?

A. In the export market, we say that one product sells another, that is, by having the great range of products, the buyer has an opportunity to order practically all his requirements. Frequently these people will charter their own sailing vessels and load them themselves. They want to buy everything they can.

That this is a correct business estimate of the demands of the foreign market is corroborated by the testimony of the president of probably the most widely diversified range of finished steel products company in this country, who (Simmons, vol. 23, p. 9403) says:

Q. In what way has your ability to carry on a foreign business been affected by the fact that you have a full line consisting of many kinds of edge tools and cutlery?

A. Without that we would have practically no business abroad.

Q. Why is that?

A. Because no one line or one item in the line would be sufficient to interest the foreign buyers. It is the completeness of the line under one brand and one uniform quality that they seem to take an interest in.

Q. That is, they buy full lines of you, do they?

A. Yes, sir.

Was It a Lawful Result?

Of the fact that this policy of foreign trade expansion was as such entered into by the company, and has since been pursued, the proofs are full (Roberts, vol. 13, p. 4969; vol. 11, pp. 4747-8). A most experienced man of one of its constituent companies, the American Steel & Wire Co., and who had the development, along the lines previously advocated (Schwab, vol. 11, p. 4147; Farrell, vol. 10, pp. 3774-5), of all the export business. In 1903, the Products company, a subsidiary of the Federal Steel Co., was created for that express purpose. A systematic plan was pursued of establishing foreign distributing warehouses and of building up new freight lines and shipping facilities. It will thus appear that whatever may be the legal consequences of the acquisition of this great volume of foreign trade, there can be no doubt of the fact that it was acquired by this company in pursuance of a well understood purpose. The proofs also show that the diversified products of the Steel Corporation, the location of its plants for export manufacture; and its facilities generally are the means by which this trade has been supplied and built up. And they also disclose the fact that the different subsidiary finishing companies of the Steel Corporation were, among other things, chosen and acquired by that company with a view to developing the very foreign trade which has since been acquired. Such being the case, it logically follows that if the possession of this great volume of foreign trade is illegal as a monopoly or restraint of trade, the Steel Corporation, of which the Products company is the mere agent, is also a violator of the Sherman law. Was, then, this foreign business acquired on the one hand through illegal methods by the Steel Corporation monopolizing or attempting to monopolize, or to restrain foreign trade? Or was it, on the other hand, the result of lawful and fair means to expand and increase American foreign steel and iron trade without driving out those who were in such foreign steel trade, or without preventing those who wanted to enter it from doing so?

We have already seen that when the Steel Corporation entered this field there practically was no existing foreign steel trade held by American steel manufacturers. We have seen the opposition existing in such foreign markets to the building up of such trade by a newcomer; we have seen that the markets of practically all the principal nations of Europe were tariff closed to American steel, and that the spasmodic dumping policy theretofore pursued by American steel manufacturers had created (vol. 10, p. 4126-7) a prejudice against American trade which had to be overcome. In that regard the proof by a witness whose long practical experience, broad grasp and commercial success in building up a discredited foreign steel trade, gives weight to his evidence. It is (vol. 10, p. 3842):

"It is impossible to develop a foreign business unless it is done continuously. Buyers will not patronize people who are not in a position to give them a continuous source of supply. We had, in the early stages of the corporation, to live down the dumping business, which was quite prevalent with some of the companies prior to the formation of the Steel Corporation. * * * * Prior to the formation of the United States Steel Corporation, some manufacturers in this country at times, during depressions here, would ship large quantities of materials to markets, principally to producing markets such as Great Britain. The result was that prices were broken down and in many instances the material was never delivered, because the customers, after the prices had been disturbed, could buy material in their own country, and in some instances, the customer has paid

compensations to sellers to cancel the contract." Indeed, the long time required to get foreign shipments of steel to their ultimate destination, and the changes in price meanwhile, makes even a regular, sustained, foreign steel business (vol. 10, p. 4126) a hazardous one.

He further says in substance:

Dumping is an uneconomic practice and one that does not develop a continuous business. It was a sporadic business and was indulged in owing to the exigency of manufacturing at the time. The export business of the corporation has been postponed continuously. It has been built up from 290,000 tons in 1903, I think, to 2,246,000 tons in 1912.

Speaking of the efforts of American steel manufacturers endeavoring from 1895 to 1901 to dump materials abroad, the same witness (vol. 12, p. 4629) says:

They were endeavoring to dispose of large quantities of material and in doing so, they dislocated those markets, and as a consequence of that the prices were greatly demoralized and the manufacturers in those markets not only met the prices made by the Carnegie Steel Co., but made lower prices; and the result was that thousands of tons of material were not delivered by the Carnegie Steel Co., and it was an actual fact that the buyers of their products paid them a compensation to let them out of the contracts after the market had been demoralized. The records of our office in London show, and I have examined them myself at times when I have been over—I was interested in looking it up—show that over $100,000 was paid to the Carnegie Steel Co. by buyers for canceling contracts after they had thrown this material on the market there to shipbuilders and all sorts of people.

It took the Steel Company (Schwab, vol. 11, p. 4148) one or two years to get the foreign business started. It was necessary to establish and maintain a series of large warehouses all over the commercial world. Space forbids details, but the proof (Farrell, vol. 10, p. 3785; defendent's ex. vol. 2, pp. 179, 189) show that nearly 300 places of business have been established in 60 different countries and in all parts of the world. That great warehouses or distributing stations have been opened at strategic distributing steamship centers. Taking Belgium, for example; it was a great manufacturing country; it had a tariff and 90 per cent of its manufactured product (vol. 10, pp. 3786-3849) was exported. Consequently there was no market for the Steel Company there, except steel car rails. But notwithstanding there was practically no Belgium market for foreign steel, the Steel Company located a large warehouse at Antwerp in which it stored 10,000 tons of steel products, principally pipe. It was compelled to do this, because from Antwerp it was able to reach trading centers it could not reach direct from the United States. In that regard the proof is (vol. 10, p. 3786), "We have shipping opportunities at Antwerp that do not exist in this country. Antwerp is a great distributing point; a large number of sailing vessels go to ports in the world that are not reached by steamers." In the same way, while the Austrian tariff (vol. 10, p. 3847) shut the Steel Corporation out of that country, it established a warehouse at Trieste, Austria, by reason of the fact that wire products and pipe can be trans-shipped at Trieste to ports on the Adriatic, Syria and Mediterranean. In the same way, the Steel Company established a warehouse depot at Vancouver, B. C., through which it furnished (vol. 10, p. 3805) light rails for lumber camps, sheet iron, wire goods and pipe. The building up of trade with British Columbia shows that the steel trade acquired there was not by the Steel Company restraining or monopolizing an existing foreign trade, but was, by its creating a new and non-existent foreign trade, in the face of serious obstacles. To reach Vancouver, the Steel Corporation was confronted by a railroad freight rate from Pittsburgh to Vancouver of $18 per ton, while the English steel manufacturer could reach Vancouver on already established lines of steamers from Liverpool to Vancouver at $7 per ton (vol. 10, p. 3805). When his steel reached Vancouver the English manufacturer paid one-third less of the preferential Canadian tariff than the American manufacturer (vol. 10, p. 3799). The result of these adverse conditions was that after the Steel Company opened its warehouse at Vancouver, it found (vol. 10, p. 3805) that it was impossible to do much business unless the Steel Company itself established a line of its own steamers from New York to Vancouver, through the Straits of Magellan. The Products company itself accordingly started such a line, which is the only one from New York to Vancouver. It has four steamers of its own in service and two chartered vessels. These vessels call en route at many ports on the west coast of South America and Mexico, at some ports which have no regular steamship line. In addition to carrying the products of the Steel Corporation, they (vol. 10, p. 3806) have "been carrying considerable quantities of material for other manufacturers in this country who had been unable to develop a business because of the lack of facilities." In order to obtain return freight for their steamers the Products company have to load them at Vancouver with lumber or coal for the Gulf of California (vol. 10, p. 3807); there they reload with copper matte for Dunkirk, France, and in France they take on chalk for New York. The whole triangular trip occupies from seven to eight months, and shows the hitherto unused methods, and the continuous, sustained effort that must be made to get and hold foreign trade. By like effort, trade suited to the varied needs of various countries has been built up. Thus, (vol. 10, p. 3787) distributing warehouses have been established at Johannesburg, South Africa, at Sydney, Australia, in New South Wales, Copenhagen, Denmark, Barcelona, Spain, Singapore, Straits Settlement, Valparaiso, Cullao, Buenos Ayres, Rio Janiero and other parts of the world to the number of 40. These warehouses (vol. 10, p. 3787) are stocked with light rails for mines, corrugated iron for building, tin plate, wire products, pipe and pretty nearly every thing the Steel Company makes, except railroad rails. The steel for South America is carried by ship loads in chartered vessels, the Products company having under charter when this testimony was taken in 1913, some 35 vessels carrying cargoes to all parts of the world. Permanent and extensive bureaus are maintained at London and at Paris (vol. 10, p. 3789, 3815), in order to sell from there to the English and French colonial possessions, buyers for which possessions gather at the two cities named. The necessity for sustained, continuous effort is shown by the proofs (vol. 20, p. 7959). For example, the Products company has a general steel trade in the Argentine Republic of $6,000,000 a year (vol. 10, p. 3794), consisting of wire products, sheet steel, tin plate, rails, structural material, street railway material, etc. Taking the item of structural steel, the proofs show the continuous means by which such trade is obtained and held. The company located a resident engineering force there, designed and built in Buenos Ayres the first steel structural building in South America (vol. 10, p. 3794), and as a result of the maintenance of such a permanent engineering force there, has built every steel structure in Buenos Ayres, and (p. 3795), "We have maintained a very large office there. We are building a number of government buildings there. We built all the buildings of the Buenos Ayres exposition. We built one for the Argentine government and one for the United States government for their exhibits there." The proofs (vol. 10, p. 3795) show that the products sold in the Argentine to make up this $6,000,000 aggregate are produced by the following subsidiary companies of the Steel Company, namely, the Carnegie Steel Co., the American Sheet & Tin Plate Co., the American Steel & Wire Co., the National Tube Co., and the Lorain Steel Co. and (vol. 10, p. 3801), the American Bridge Co. It will be noted that these products with the exception of the Lorain Steel Co. practically come from the Pittsburgh district, and thus substantiate the proof (vol. 10, p. 3829) that the Federal Steel Co. was driven to further expansion and integration in order to enter foreign trade.

Trade in China and Cuba

A similar trade of diversified articles amounting to $4,000,000 (vol. 10, p. 3802) has been built up through agencies in four principal commercial centers in China, and a trade (vol. 10, p. 3812) of $5,000,000 in Cuba. As evidencing that the foreign trade was largely newly created, instead of taken from others, reference may be made (vol. 10, p. 3811) to the trade built up in Black Sea territory. The steel, pipe and wire products from the American Sheet & Tin Plate, the American Steel & Wire, and the National Tube companies were at first sent to Hamburg and there transshipped. The building up of that trade by the Steel Corporation has caused (vol. 11, p. 3811) the establishment of a direct line sailing every six weeks from New York to the Mediterranean, for which the Products company furnished the nucleus of each cargo, viz., from 3,000 to 5,000 tons, but which afford shipping facilities to American manufacturers of all kinds of product. In the same way, a sustained trade of $6,000,000 a year (vol. 10, p. 3818) has been developed in Japan. This trade consists in pipe, railway material, structural bridge steel, light gauged steel, tin plate and street railway material, in all (vol. 10, p. 3819) to the extent of 25,000 tons per month. In addition to using the regular steamer lines, three or four vessels chartered by the Steel Corporation carried out entire cargoes each

month from New York to Japan, of the varied products (p. 3818) of the Carnegie Steel Co., American Steel & Wire Co., American Bridge, American Sheet & Tin Plate, National Tube and Lorain Steel companies, respectively.

We have cited the above comparatively few foregoing proofs to illustrate the Steel Company's foreign trade is due to its own continuous and indefatigable efforts (vol. 10, p. 3844-6), to build up this trade on legitimate, commercial lines and not by trade restraint or monopoly at the expense of its competitors. It has been the creation of a new American foreign trade and not the monopolistic seizure of a pre-existing American foreign trade. Space constrains us to go into the extent of territory and the varying character of that trade, the varied and individual requirements that had to be met in different markets, all of which show conclusively that the dumping, spasmodic foreign trade practices in vogue in the steel trade at the close of the last century were at variance with the building up of dependable foreign trade, and that with the Steel Corporation has come the substitution of reasonable, sound and successful commercial practices in which, and by which, under the proofs in this record, a dependable foreign steel trade can alone be built up. All these proofs, facts and results, serve to justify our conclusion, which we find as a fact, that this foreign trade of the Steel Corporation has not been gained by monopoly and is not a monopoly, that it does not, and has not, restrained trade; but on the contrary, others in the steel trade (Youngstown, vol. 19, p. 7708; Maryland, vol. 20, p. 7979) have been, at the same time, free to enter such foreign trade and have done so to the extent of their resources. From a business viewpoint, the matter is well summed up by an experienced business man produced by the government, who, speaking of the wire and nail business with which he has been familiar, and of the export business of the Steel Company, says, (vol. 5, p. 2033).

> I would say that it is the magnificient organization of the export department of the Steel Corporation which accounts for their success to a large extent. In every country in the world, they meet the conditions; for instance, they have to have different gauges in different countries and different size kegs. In Japan there is a unit there which is different from elsewhere. Ours is a keg of 100 pounds, but theirs is a keg of 133 pounds. Now, to know how to reach all the different countries and supply the needs according to the circumstances and give them prices, and so on, in their own money, or it may be in English money— it is their wonderful organization that enables them to reach out as they do.
>
> Q. So the organization of the United States Steel Products Co., which handles the foreign business, is a very valuable thing for the steel trade of this country, is it not?
>
> A. Absolutely so. It is a wonderful organization.

Bearing on the systematic organization thus referred to, the proof (vol. 10, p. 3788) is, in substance, as follows:

> The managers of these large offices in foreign countries are almost entirely Americans, and nearly all of them have been trained in our offices here. We have a civil service system in our business, and our men are promoted from one office to another according to their aptitude for business in certain countries. One man might be a good business man in Brazil and might be a total failure in Australia.

As showing that this foreign trade has been built up on business executive effort, we may here refer to the facts later noted, namely, the very material decrease in the cost of selling and the very material increase in the prices obtained. And in that connection, namely, the increase in price obtained for goods sold abroad, and the decrease of price for goods sold in the United States, the proof (deft's ex., vol. 2, p. 190) shows the important fact, namely, that this foreign trade has not been built up at the expense of the home market. Without entering into the details of that exhibit, it suffices to say that some 80 steel or wire products are there listed, all of which have been sold at materially higher prices in the foreign, than the same articles were being sold for in the home market. We find in that list such important and widely used articles as tin plate, structural steel, blooms, billets and slabs, axles and steel wheels, plates, bars and hoops, T rails, pig iron, black and galvanized pipe, seamless tubes, horse shoes, wires of all kinds, nails and spikes, fences, bale ties—for all of which higher prices were charged and obtained in the foreign market than those paid by the domestic consumer. In connection with that exhibit, we note the testimony of W. E. Corey (vol. 9, p. 3042), who says that during the time he was president of the Corporation:

> The Products company had become so well established and had worked up such a line of customers, and trade conditions in the world were such that at times as high prices were netted to the mills on foreign business as on domestic, and on some occasions were higher on certain contracts.

To the same effect is the testimony of James A. Farrell (vol. 10, p. 3853), who says:

> Q. Accordance to this statement, exhibit No. 42, the gross tonnage of the Corporation increased between those years from 1,001,716 to 2,243,138 tons; that is, from 1904 to 1912; or 123.9 per cent?
>
> A. Yes, sir.
>
> Q. While the selling value increased 181.7 per cent?
>
> A. Yes sir; 181.7.
>
> Q. Or an increase of the average per gross ton of 25.8 per cent?
>
> A. Yes.
>
> Q. What occasioned that increase in the average price per ton received by you on these export sales?
>
> A. Because of the fact that we were constantly selling a higher priced product; that is, we were selling the various commodities in highly finished lines, and fewer of the products in semi-finished and coarser lines.
>
> Q. How was it that you were able to increase the value or improve the kind of product you were selling in that way? Was it because you were becoming established, or why?
>
> A. It was a natural development, due to the fact that we had established offices all over the world, and because of the fact that our mills were getting into a state of preparation to do this diversified business.
>
> Q. In addition to selling the higher grade of goods, more finished articles, how do the prices upon these specific commodities compare per ton, in 1904 and 1912, as a rule?
>
> A. They show an increase of about 25 per cent.
>
> Q. Then your increase was caused by that also, that you were able to get better prices on a specific product?
>
> A. Yes, sir.
>
> Q. Or many of the specific products?
>
> A. Yes.
>
> Q. That is all detailed, is it not, in defendants' exhibit 42?
>
> A. It is.
>
> Q. Year by year?
>
> A. Yes; 1904 to 1912.
>
> Q. Inclusive?
>
> A. Yes.
>
> Q. This exhibit 43 shows an increase in the domestic business in tonage for 1904 to 1912 of 87 per cent, or from 5,818,149 tons to 10,877,544 tons, and an increase in the selling value of 65.2 per cent, or a decrease in the average per gross ton on shipments to the domestic market of 11.6 per cent?
>
> A. 11.6 per cent.
>
> Q. What was the occasion of that?
>
> A. Because of the fact that prices in the domestic department have constantly shown a decline. We are getting about $8 a ton less for materials in the domestic market than we were receivinng in 1904.
>
> Q. You have stated that you are getting about $8 per ton less in the domestic market than you did in 1904, that is, you did in 1911?
>
> A. Yes.
>
> Q. Has the price in the domestic market fluctuated in that time or less in different years?
>
> A. More or less, but it has gradually shown a lower return.

In this matter we have not overlooked government ex., No. 205 (vol. 4, p. 1614), which challenges some 11 articles of export. It will be observed, however, the exhibit itself concedes that the prices include "in the majority of cases the freight and insurance to destination". As we have no facts and figures as to the separate items of such "c. i. f." exports, we have no proof warranting our excepting them from the conclusions stated above, namely, that higher prices have usually been obtained in the foreign market than have been charged in the domestic.

It will thus be seen that the significant factor in the view of the experienced witness quoted above (vol. 5, p. 2033) is in the Products company ascertaining, meeting and supplying the individual need of individual foreign markets. And as emphasizing his illustration of a different nail keg unit in Japan, as the basis of doing business, it might be added that to gain a foothold in the trade of India another unit was demanded. For the proofs show (vol. 10, p. 3792) that in India the keg unit does not prevail at all; that there the nail unit is a seven-pound package of nails in paper packages, which are put up in such packages at the nail mill at Allentown, Pa., a seaboard plant which was acquired with the American Steel & Wire Co. In the same way, the proofs show (vol. 10, p. 3792) the markets of Australia demand an oval nail, while in Java a round one is required. Indeed, the absolute necessity of making different goods for the foreign markets from those made for home trade is illustrated by the proofs of the large ex-

pense necessarily incurred to meet these local foreign requirements. Thus the evidence (vol. 10, p. 3881) is. "The first rail order was executed at the Tennessee works was for the Argentine government; for the Chumbicha railway. We expended on the rolls, in preparing the rolls for that order, something like $74,000. That was for the first order", and (vol. 10, p. 3844) "after the Corporation acquired the American Steel & Wire Co., they expended $800,000 on the Allentown mill in order to diversify its products and increase its opportunity to do a wider range of foreign business than it was doing at the time."

Conclusions

A patient study of the proofs of actual business facts, difficulties and efforts shown in the testimony of experienced business men lead us to these conclusions: First, that the foreign business in steel and iron done by the Steel Corporation has increased (vol. 10, p. 3843) from 290,000 tons in 1903, to about 2,250,000 tons in 1912, and in value from $31,000,000 in 1904, to $91,000,000 in 1913 (vol. 10, p. 3783); second, that the Steel Corporation normally does from 80 to 90 per cent of the foreign iron and steel business of the United States (vol. 10, p. 3897); that its exports of $91,000,000 in 1913 includes $30,000,000 of "re-export" business, so-called, which it does in connection with other American manufacturers using its basic products. That the "re-export" business in connection with other companies (vol, 10. p. 3848), gave employment to from 15,000 to 18,000 men, and the foreign business of the Steel Corporation to 40,000 men.

Third, that its competitors in the iron and steel business, with some few exceptions (vol. 19, p. 7709), do not seek to enter the foreign market so long as they can get a market at home (vol. 10, pp. 3845, 3847, 3897; vol. 20, p. 7980; vol. 28, p. 12039), and what foreign steel business there was prior to 1901 had been small and generally not profitable and was done at from 7 per cent to 11 per cent expense on invoice (Farrell, vol. 10, p. 3791; gov't. ex., vol. 3, p. 1133; Painter, vol. 5, p. 1974; Stevenson, vol. 3, p. 1093; Benner, vol. 6, p. 2499; in connection with Farrell, vol. 12, p. 4628; Gary, vol. 12, p. 4758; deft. ex., vol. 9, p. 731).

Fourth, that the success of the Steel company in building up this continuous foreign trade primarily consisted in its mechanical ability to make the wide range and variety of product required by foreign markets, and in its manufacture of such diversified products at plants properly located for export trade (vol. 10, p. 3790, 3843, 3844, 4128; and vol. 11, p. 4320; vol. 13, p. 5017; vol. 23, p. 9403; vol. 20, p. 7978, 7979). In that connection reference might be made to the proof (vol. 10, p. 4128) as showing how essential to the maintenance of foreign trade is the diversity of product which comes from broad integration (vol. 10, p. 4128).

Q. Can a manufacturer having a large line of products for sale afford to maintain such warehouses and conduct that business, when a person manufacturing only one line of goods could not afford to do it?

A. It was tried by the National Tube Co. before the formation of the Steel Corporation. They established a large warehouse at Johannesburg, South Africa, and were obliged to abandon it for two reasons, one because of the cost of doing business. It cost them over eight per cent to do the business, because they had one line of goods to sell only.

Fifth, in gradually reducing its overhead cost of foreign selling (vol. 10, p. 3791) from about 3½ per cent in 1901 to 0.8 per cent in 1911

Sixth, in gradually increasing the price of such of its product as was sold in the foreign market from 1904, when the trade had gotten under way, to 1912, while it was at the same time gradually decreasing the price of such of its product as was sold to consumers in the home market (vol. 10, p. 3853-4-5). These relative changes are shown by defendant's ex., vol. 2, p. 203, as follows: In 1904 the Steel Corporation sold such of its product as it exported at an average price of $27.22 per gross ton; by 1912, it was able to market them at $34.24. During the same period, it was in 1904, receiving for such of its product as was sold in the home market an average of $41.44 per gross ton; by 1912, this price was reduced to $36.53.

Not Contrary to Law

With these facts, figures and results, proved in this record, we are warranted in holding that the foreign trade of the Steel Corporation, its mode of building it up and its retention when built up, are not contrary to the Sherman law. To hold otherwise, would be, practically and commercially, to enjoin the steel trade of the United States from using the business methods which are necessary in order to build up and maintain a dependable business abroad, and if the Sherman law were so construed, it would itself be a restraint of trade and unduly prejudice the public by restraining foreign trade. Happily, it is open to no such charge, for as the Supreme Court in the Standard Oil case said, "One of the fundamental purposes of the statute is to protect, not to destroy, rights of property."

Inherent Qualities

Seeing, then, that the Steel Corporation, at the time this petition was filed, was engaged in the natural and normal conduct of business, both home and foreign, and that it was not then monopolizing, restraining or attempting to monopolize or restrain trade in iron and steel between the states or with foreign nations, we next turn to 1901, the year the corporation was formed, and address ourselves to the inquiry whether it was formed in order to so monopolize or restrain trade; or, to use the test fixed by the Supreme Court, Nash vs. United States, supra, was the Steel Company, when created, a combination which by its intent, was meant to, or by the inherent nature of its contemplated acts would, "prejudice the public by unduly restricting competition, or unduly restraining the course of trade?" Now what is meant by the phrase, "The inherent nature of its contemplated acts." which violate the statute when an illegal combination is originally formed, and which continuing, because inherent, elements, warrant its dissolution whenever questioned, is illustrated by what was found to be the fact in the Standard Oil case. There the court based its right and duty to dissolve the Standard Oil Co. on the two facts that, first, the Standard Oil Co. destroyed the *"potentiality of competition"*, and second that it was "monopolization *bringing about a perennial* violation of the second section". And that there was in the Standard Oil Co. of New Jersey a destruction of the power to compete—the *potentiality of competition*—and *a perennial continuous and perpetual violation of the law* was shown, in the court's estimate, (page 75) by the following state of facts:

A. Because the unification of power and control over petroleum and its products which was the inevitable result of the combining in the New Jersey corporation by the increase of its stock and the transfer to it of the stocks of so many other corporations, aggregating so vast a capital, gives rise, in and on itself, in the absence of countervailing circumstances, to say the least, to the prima facie presumption of intent and purpose to maintain the dominancy over the oil industry, not as a result of normal methods of industrial development, but by new means of combination which were resorted to in order that greater power might be added than would otherwise have arisen had normal methods been followed, the *whole with the purpose of excluding others from the trade* and thus centralizing in the combination *a perpetual control of the movements of petroleum* and its products in the channels of interstate commerce.

At this point, we deem it proper to specially note these vitally important terms used by the Supreme Court, viz., the destruction of "the potentiality of competition", and the "perennial violation" of the statute. For when it comes to the question of the dissolution of a combination, and that is the phase of this case we are now considering, a dissolution must be decreed whenever the inherent nature of its contemplated acts are such that from its very nature the combination was bound to destroy "the potentiality of competition", and these violations were, from its inherent nature, bound to be perennial. In other words, the Standard Oil Co. had to be dissolved because its inherent nature was such that it was bound to destroy the power to compete in petroleum, and it would not be heard to say it had no intent to destroy competition when its inherent nature had made it do so. It therefore follows that if such destruction of the power of competition, and that by perennial violations, thus evidenced the original inherent illegal nature of the combination, it would seem that if a long series of years had not resulted—in a combination either destroying actual competition of others or of their power to compete, or had not resulted, in the long years of the combination's business, in constant, perennial violations of law, it could not reasonably be held that the inherent, original nature of such combination was such as to make it unlawful when originally created and liable to dissolution whenever afterwards challenged. On the contrary, it would seem that the acts of a combination are fair tests of the

real inherent nature of the combination and that in such case the time-tried rule, "by their fruits ye shall know them," might well serve to best gage the source or tree from or on which the fruit matured. But passing by this time-tried rule with its practical tests of what the Steel Company did in the 10 years subsequent to its creation, let us address ourselves to the proofs of what was done at or about the time the Steel Corporation was formed, and from those proofs alone determine whether the object of those forming it was to prejudice the public by unduly restricting competition or unduly obstructing the course of trade, or even if there was no such intent, was the inherent nature of the Steel Corporation's contemplated acts such as to prejudice the public by unduly restricting competition or unduly obstructing the course of trade.

When Minds United

A study of these proofs satisfies us that the United States Steel Corporation could not have been formed unless the minds of two men had previously united in a common purpose. Those two men were J. Pierpont Morgan and Andrew Carnegie. With them cooperated Charles M. Schwab, the president of the Carnegie Steel Co., Elbert H. Gary, president of the Federal Steel Co., and James H. Reed, the counsel of Mr. Carnegie and a director of the Carnegie company, all of whom, except Mr. Carnegie, became directors in the Steel Corporation. While the cooperation and participation of other persons and other companies subsequently aided and was necessary to the carrying out of the purposed formation of the Steel company, yet, laying aside all mere incident and going to the crux of the case, it is clear from the proofs that the Carnegie company held such a dominant relation to the steel and iron trade, and Mr. Morgan held such a dominant relation in finance that unless Mr. Carnegie, who was the controlling shareholder of the Carnegie company, and Mr. Morgan, through his relation to the finances of the country, and as a director of the Federal company, could make possible a purchase of the Carnegie company by the Federal company, the United States Steel Corporation could not, and would not, have been formed. As Messrs. Schwab, Gary and Reed all aided in bringing the two principals to an agreement, and as the result of such agreement was the formation of the Steel Company, we are justified in saying that, if there was intent to violate the Sherman law, to be effected through the organization of the Steel Company, then such company was primarily the work of Messrs. Carnegie and Morgan, assisted, of course, by all those who participated in the furtherance of this primary purpose of bringing the principals together, as directors of the Federal Steel Co. in agreeing to a purchase of or in forming and taking part in the management of the Steel Corporation itself.

Remarkable Rapidity

Considering the magnitude of what was done, the mere sequence of events which resulted in the formation of the Steel Company had a directness, a simplicity and a rapidity which is remarkable. On Dec. 12, 1900, Charles M. Schwab made an address at a dinner given to him in New York in which in substance he gave a clear statement of the steel business, showing that the metallurgical methods of making steel and the physical methods of handling it were then fully developed, and he outlined his notions of wherein further advance was possible. His testimony as to his address is:

I talked about the advantages that might be derived from doing a manufacturing business on a larger scale than had then been attempted, and that we had undertaken in the manufacturing lines up to that time; all our endeavors up to that time had been to perfect methods of manufacture. By that I mean metallurgical and economical methods. By economies I mean that I believed that we had then reached the limit, or very nearly so, at which economies from a metallurgical or mechanical standpoint could be made effective, and I believed that the next great step in economical manufacture was to so regulate the business and plants of the business in manufacturing on a larger scale than had ever been attempted heretofore; that instead, as was then the practice, of having one mill to make 10 or 20 or 50 products, the greatest economy would result from having one mill make one product and make that product continuously. The history of manufacture has shown that any line that specializes in any direction obtains the best economical results, and I believed that the various lines of steel should be so specialized; that it was not possible for any one company then to do that at once, but I also believed that great economies would result from locating mills at the point of consumption, by which the cost of transporting the finished material to the point of consumption would in many cases be reduced or saved. I also pointed out that I believed that great economic results would follow from our 'beinng able to manage these concerns in a manner that would stimulate the most effective effort in the management of the different concerns.

* * *

I went on to say that one of the most effective things would be our ability, as I said before, to stimulate the various managements. Secondly, or thirdly, I felt that the great export business of this country in iron and steel could only be done in that way. I felt, furthermore, that great economies would result in all these general items of expense which are met in the manufacture of iron and steel, on account of selling, traveling, office expenses and all the general items that each individual concern with an individual line had to cover with a full organization. That could be covered by one such organization, and I felt that much economy would result in that direction, and indeed the whole line of my talk that evening was intended to show that the next great economic step to be made in the manufacture of steel, or indeed any business in general—I did not confine myself entirely to the steel business—directly to the steel business, but in general, that the great economic result to be next obtained in manufacture was by the adoption of these methods, and then I made that application generally to the steel industry. * * * * I pointed out for example, the attempt that had been made to manufacture steel cars, that a few companies throughout the United States who were engaged in the manufacture of bridges and other fabricated materials, were attempting to manufacture steel cars; that that could never be successful; that the only way it could be successful was for some one works to devote itself exclusively to the manufacture of steel cars, and one kind of steel cars; that if different kinds of steel cars had to be made, like passenger cars, for example, as being different from freight cars, two separate works, as following out this general line of policy would have to be built and so operated. I then pointed out, for example, structural steels. In those days, a structural mill would probably make six different sizes of beams and channels and angles; by my plans, a mill would be built that would roll on angles exclusively and a mill woud then be built that would roll on beams exclusively, and that the finished material, and so forth of these mills, being adapted for that special thing would be better and cheaper.

* * *

Well, Mr. Morgan listened with interest, and then asked me to sit down and talk with him a few minutes. The dinner was short, and we sat in a corner and talked for sometime at more length and with more amplification upon this subject.

Morgan and Schwab Talk

Shortly afterwards Morgan sent for Schwab, who says:

This whole subject was then gone into with much more detail, and the theory which I then advocated was amplified with reference to its application to the steel industry; and I pointed out at that interview to Mr. Morgan in great detail the economies and advantages that would result under those theories from their application to the steel industry.

Q. Was there any suggestion then, or discussion with regard to the advisability of a large corporation with facilities for manufacturing on all lines?

A. There was; that was the chief discussion of the evening.

Q. Can you go into that a little fuller?

* * *

I told Mr. Morgan that if the steel industry of this country were to start anew, that if there were no steel plants here, what I should advocate and build up was such a plant as I have described heretofore; but that in view of the fact that the most of these things did exist, perhaps not in an ideal way or ideal location, that a new plant would be made possible, and that in view of the fact that they did exist, and that they could be made ultimately to conform to this theory, I believed that the then existing steel plants which I pointed out to him could be formed into one company, which would ultimately accomplish all the results which I had outlined. That was discussed at some length. The companies were mentioned that I thought would accomplish these results. They did not, by any means, embrace all the companies in the United States, but those which I thought would effectively make such an organization as was outlined.

Q. Were they such as to cover all the branches of the industry?

A. They were.

Q. And what was your discussion with him with regard to the foreign situation?

* * *

With reference to the foreign situation, I pointed out to him that up to that time our business, the steel business in general, had been nominal with reference to export business; and that, in my opinion, it could only be made profitable and possible by such an organization; that no company selling an individual line, a single line, or one or two lines, could hope to successfully compete for foreign business where they were not prepared to furnish the customer every line that he might require for a structure or a business; and that half a dozen or a dozen

individual companies could not afford the expense of the organization or secure the talent necessary to make a successful export business, while such a company as I outlined could.

* * *

Q. Did you mention the facilities that such a corporation as you described would need to possess?

A. I did; and I may say that I enlarged and perhaps made a more strenuous talk to Mr. Morgan upon the subject of export and our ability to export and foreign business in foreign markets than any other, excepting only the economic advantages to be derived.

* * *

With reference to the ore, I pointed out to Mr. Morgan how advantageous it would be, for example, for one mine to mine all it could, regardless of what furnaces or products it was to go to, and have that ore then distributed by an expert between these hundred furnaces that would then operate; instead of five or six, by which the mine could run continuously and run at a given amount and under the most economical conditions, regardless of how the ore was then to be distributed; because when a firm owned five or six furnaces, it was a question of how much of each kind of ore from each mine they could use, but when a firm owned 100 furnaces, the question of distributing the ore from each individual mine to that furnace became a simple and effective one; and that that would be of great advantage from a mining point of view. The fact that one mine contained ore of a high percentage of phosphorus might make it possible in an individual concern to only run it half the year; while if the product from that mine was to be distributed to 100 furnaces, the additional amount of high phosphorus would be so little as to be no disadvantage and therefore that mine could run continuously. With reference to the handling of the ore from the mines to the docks in the days of individual ownership, it was exceedingly difficult at the docks and on the railroad to keep the ores for the different firms and from the different mines separated and shipped as they desired to handle it upon their boats; whereas, with this large ownership of works, it was possible to ship the ore to the various docks as fast as it came down, without any of the expense from delay. The ships, instead of waiting at the docks until their special load of ore could come around and take the ore, they would come into port and depart ten hours later, instead of three or four days later. Because the ore was always there ready to load on the ships. There is nothing in shipping that costs more than delay in discharge and loading; and therefore, that very great economy was accomplished at once. I think the records of the ships will show today that a very small fraction of the time was consumed in handling the materials at terminals, as compared with what it was in times of individual ownership. So I went through from ore mines, railroads and shipping to handling of material, right down to the finished material, which was the same thing as I have described before, with reference to individual efforts.

Q. Did you or not speak of the advantage of a company owning its ore and its furnaces, and its rolling mills and finishing mills?

* * *

* * * I told him—I will put it that way—that up to 1892 there was a very strong feeling that manufacturing companies should not own ore; but that had then changed. The Carnegie company was gradually acquiring ore wherever it could, and to my mind the successful manufacture was only possible where every single step in the line of manufacture was carried out by some one concern; and that for the greatest economy, for the greatest development of the business; it was an absolute necessity.

That the possibility and desirability of creating an American company capable of acquiring foreign trade should have been especially dwelt upon by one so thoroughly conversant with the steel business will be quite apparent when the significance of the proofs as to the relative relation of the export trade of the great commercial European countries is considered. The export steel trade of England is (vol. 10, p. 3898) 65 per cent as contrasted with 35 per cent of home trade; Germany (vol. 10, p. 3898) sends 60 per cent of her steel abroad as against 40 per cent consumed at home; Belgium (vol. 10, p. 3849) sends 90 per cent of her product abroad.

The outcome of this second talk was that

Mr. Morgan was very much interested, and said to me that if I could secure a price from Mr. Carnegie, that he would undertake the formation of such a company; that he would undertake the business; that is the way he said it. (vol. 11, p. 4141).

Carnegie Willing

Within two or three days Mr. Schwab saw Mr. Carnegie, and while the latter declined to give any written option, he expressed himself as willing to sell. Certain figures, then jotted down by Mr. Schwab or Mr. Carnegie, were carried by the former to Mr. Morgan, and were the basis on which Mr. Morgan proceeded in the formation of the Steel company, although he had then no written agreement from Mr. Carnegie whatever. These facts are shown also by others (vol. 12, p. 4727). This situation continued until Feb. 26, 1901, when Mr. Morgan obtained a formal letter from Mr. Carnegie through Judge James H. Reed. The latter's testimony (vol. 14, p. 5658), is:

He (Mr. Morgan) told me in substance that he had just awakened to the fact that he was making contracts with the stockholders of the Federal, the National, the National Tube, and so on, and that he had not the scratch of a pen from Mr. Carnegie under which he could hold him or his estate, if he died. He said, "You men go up the street as fast as you can and get me something." We took the elevated and went up to Mr. Carnegie's house and explained what we were there for. Mr. Stetson and I, then, with occasional interruptions from Mr. Carnegie, dictated a letter to Mr. Morgan, of J. P. Morgan & Co., which Mr. Carnegie signed, and took the original down with us to Mr Morgan and he seemed relieved. I don't think we left any copy with Mr. Carnegie.

By such letter (Exhibit 80, vol 3, p. 325, Deft. Ex.) Mr. Carnegie agreed to sell his mortgage bonds and stock in the Carnegie Steel Co. and agreed to receive in lieu thereof mortgage bonds of the United States Steel Co. The letter also provided that his sale was conditional on the Steel Company taking holdings of the other shareholders in the Carnegie Steel Co. at the same rate, but instead of paying them in bonds as he was, they were to be paid in stock of the new company. The testimony (vol. 14, p. 5656) shows that Mr. Carnegie was anxious to sell and retire from business. Indeed, several efforts had previously (vol. 14, p. 5474-5475-5513; vol. 11, p. 1132; vol. 12, p. 4722-4723-4725) been made to sell the Carnegie company. On the consummation of the sale, Mr. Carnegie took no stock in the new company and had no part in its management. While, of course, he knew what companies the Steel Company was absorbing and was keenly alive as to what properties his purchase money bonds would cover, and, indeed, in respect to one company, the National Steel Co., which occupied a midway position between Chicago and Pittsburgh, insisted (vol. 12, p. 4747) that it be taken in and his bonds cover their property, there is no proof whatever that he occupied any other relation than that of a seller of his stocks and bonds in his own company. Indeed, the dealings between the two men; the fact that they did not meet each other; their not even talking to each other about the plans, scope and future of the new company; their allowing the intended sale to stand without any written evidence that it had been made; the inability or difficulty either of them would have had in its being carried out if either had died, conclusively show that the whole transaction between the two was that of a sale of Mr. Carnegie's personal holdings effected between them through the medium of third persons. We are, therefore, warranted in finding, as we do, that there is no evidence whatever to show that Mr. Carnegie united with any one to join in any violation of the Sherman act, and that the statement in his answer filed in this case, to-wit, "that his sole motive in agreeing to the sale of the property to the Carnegie company to the United States Steel Corporation was his desire to retire from the hazards and responsibilities of active business, and that since said sale was concluded, he has had no connection with the business of the purchasing corporation" is true, and a conclusion which is supported by the evidence hereafter quoted at length showing the reasons which led to Mr. Carnegie being willing to sell.

Impression of Monopoly

We turn next to Mr. Morgan and such other persons as co-operated with him in forming the Steel Corporation and see what the proofs show. The vast size of the Steel Corporation they formed, the influence and control incident to such size; its seeming power to crush competition; its ability to absorb business through its systematized organization, are all factors so associated with monopoly, to restrain trade and crush out competition, that we may say that standing alone as a mere isolated fact, this great company gives one such an impression of monopoly that we feel we may in this inquiry place the burden upon it and its formers to satisfy us by affirmative proof that monopoly was not the purpose for which it was formed, but that it was the normal,

regular and natural outcome of the improvement in steel making, and its concentrated powers were only such as were deemed to be necessary to successfully producing and marketing its product. To such inquiry and the proofs bearing thereon, we now address ourselves.

Gradual Evolution

The iron and steel trade of the United States has been a gradual, sustained evolution. So far as the metallic base is concerned, such evolution may be broadly stated to have been from iron to steel, from steel to bessemer steel, from bessemer to open hearth. It is interesting to note that the next development (vol. 10, p. 4068; vol. 26, p. 11066) bids fair to be from fuel smelting to electric smelting. These several stages of development have been accompanied by an abandonment and loss of equipment of great value (vol. 2, p. 4167; vol. 2, p. 732, vol. 10, p. 3857, and 4077; vol. 13, p. 4963), and have necessitated vast further expenditures for new appliances to make the new open hearth steel product. To illustrate, referring to a single one of the rapid revolutions in steel making—the removal of phosphorus in pig iron in the bessemer or open hearth processes by the substitution in the lining of lime for a silicon base. This simple chemical fact, made public in 1885 (vol. 13, p. 4940), "practically revolutionized the iron industry and by the year 1890, basic open hearth steel had practically supplanted the use of wrought iron for all commercial purposes." Side by side with these rapid metallurgical changes of product there were at the same time going on radical changes in the mechanical handling of the product. To refer to but one of the many mechanical changes, "in the late eighties" (vol. 13, p. 4940) "the introduction of electricity as a motive power, also produced another revolution in the steel industry, so that practically all works had to be rebuilt if they desired to keep abreast of the recent developments of the art". But not only were metallurgical and mechanical changes taking place with regard to the different stages of metal production, but there developed at the same time a radical change not of one product or one stage, but of all stages in the way of rounding up plants, or, as as it is called, integration, so that continuous processes could be carried on. In the old method of wrought iron making there was no continuity of operation (vol. 12, p. 4954). The molten metal produced by a blast furnace was run into pig iron. This pig iron was transported to a rolling mill where it was first puddled and then rolled into muck bar, which was again suffered to cool. The muck bar was again heated and rolled in finishing mills. As steel making progressed, its manufacture by various agencies (vol. 13, p. 4944), not necessary here to detail, became a continuous fluid process. Instead of the metal being suffered to cool, it was continuously treated first as a fluid and then as an ingot, but always without entirely losing its initial heat. But these steel plants with the continuous processes and their increased capacity to produce served to confront the finishing plants with grave problems in reference to their basic supplies. This era of change and its new problems is testified to by Percival Roberts Jr., whose experience and relation to the steel business give weight to his summary of the changing conditions and problems confronting that industry. He testified (vol. 13, p. 4944):

I think I had reached the situation existing as of the late eighties when basic open hearth steel was gradually or rapidly, I might say, supplanting wrought iron. The wrought iron plants that were of smaller capacity and had insufficient capital or lack of sufficient tonnage to dispose of the product of an economical steel plant, commenced purchasing billets and blooms from those who had converted their plants into steel manufacturing ones. This production of billets and blooms was practically a by-product with the finishing mills. In times of activity, they had very little surplus product to spare. When not so pushed on finished material, they disposed of part of their steel melting capacity in the shape of semi-finished material. The iron plants purchasing this material found that the same could not be carried on successfully, due to the fact that it required an almost unlimited capital to be locked up in supplies of billets, as finished material required so many different weights of billets and blooms that the stock on hands had to be enormously large; also the chemical requirements of orders required that different grades of steels should be used. This also required a vast amount of material to be carried at all times on hand. Another matter which occurred about that time changed very materially the situation, and that was the introduction of what was known as the Jones mixer. I might say that up to that time the production of all blast furnaces was run out from the furnace in the shape of liquid pig iron and cast in the sand and allowed to become cool. The invention of the Jones mixer was for the purpose of carrying on the production of steel as one continuous operation from ore to the finished product, never permitting the material to become cold until it reached the final economic shape.

* * *

The Jones mixer is a large vessel placed between the blast furnace and the steel works in which the product of the blast furnace is run in liquid form, making a large reservoir of fluid pig iron from which ladles are taken in liquid condition, the contents in liquid condition and used in bessemer converters or open-hearth furnaces. The advantage of this process was that it reduced the cost of manufacture in this one respect alone by about one dollar a ton, which is the cost of remelting cold pig iron for steel production.

The situation from 1890 on grew more and more acute. Those concerns which had become more or less integrated and had changed their methods from those of iron to steel were continuing their integration to even a greater extent than before, although I would like to say that even prior to the introduction of steel the matter of integration was one of varying degree, even in the manufacture of wrought iron, although there was not the same necessity for it. In those days, one man mined ore, another man run a blast furnace, another man operated rolling mills. The processes were all disconnected.

* * *

Coal and limestone were sometimes separate, sometimes controlled by one party, but even in those days there were certain establishments which controlled their material from the ore and limestone up to the finished wrought iron product, so that even in those days iron manufacturers were not on the same basis as regards competition. Those concerns whose output—I speak now as of about the year 1890—those concerns whose output was of a character and of sufficient tonnage and who controlled sufficient capital to enable them to convert their works from iron to steel did so, but there were a vast number of those whose character of product was of a less heavy nature, such as sheets, small bars, light plates, etc., who neither had the capital nor the output to warrant them in making, or rendered it possible for them to make, this change. There was also another class of establishments, namely, the blast furnaces who had heretofore supplied the puddling furnace or the rolling mills with their pig iron for making bars. Those concerns found themselves without customers and they in turn were forced to develop a product which would take the place of their former one. These smaller concerns were buying, as I say, to the best of their ability, their billets, blooms and slabs from the larger concerns who were making them in a certain sense as a by-product during the years from about 1890 to 1896.

These revolutions which I have spoken of, due to the introduction of basic open-hearth steel in place of wrought iron, were the fundamental reasons for all the earlier aggregations of work which took place about the year 1898, and through that year down to say 1900. Certain of them were integrated, like the Federal Steel and The Carnegie Steel Co., backward to their supplies of raw material and to the extent which they had formerly been customers, they to that extent became producers. The other concerns, like the National Steel, were composed largely of blast furnaces that had lost their custom for pig iron and who found themselves compelled to produce, instead of pig iron, billets and blooms for sale to those who had formerly used wrought iron. The Tin Plate, the Sheet Steel, the Hoop, the American Steel & Wire, were composed of concerns who individually were neither able, for want of capital or amount of output, to change from wrought iron or to manufacture steel in sufficient quantities to make it commercially profitable to do so.

The Tin Plate company had been a consumer and not producer of wrought iron product, and in fact, the manufacture of tin plate had not taken place in this country until after the introduction of the use of open-hearth steel. So far as I included them in my answer, I meant to state that they individually were unable to produce the raw material from which their finished product was made, but by combining these individual units they would be enabled to do so economically.

Tendency of the Times

The tendency of the steel business during these years toward concentration, combining, rounding up or continuity of operation is reflected in the census figures. On the one hand, is an unprecedented growth in the volume of the steel and iron business done and of the increase of capital; on the other hand, is a striking decrease in the number of establishments doing it. Thus Bulletin No. 78, census of manufacturers, 1905, iron and steel and tin and terne plate, issued 1907, by the department of commerce and labor (vol. 13, p. 4948-4950) says:

The growth of steel production has been the heaviest of any portion of the iron and steel industry. The product of 1900 shows a gain over that of 1890 of 6,510,348 tons, or 155.9 per cent, or an average increase of about 650,000 tons per year. The product of 1890 shows a gain over that of 1880 of

3,147,271 tons, or 306.3 per cent, an average increase of nearly 315,000 tons.

Whether the cause of this enormous increase of production on the one hand was due to the rounding up process of decreasing the number of plants and further expanding those that remained is, of course, speculative, but the bulletin in question does show that decrease in the number of separate plants with increase of capital in those remaining was the actual fact in the iron and steel business. In that regard, the same bulletin shows that there were in 1880 in the United States substantially 1,000 of such establishments, with a capital of $230,000,000. By 1890, these 1,000 had decreased to 838, but the capital of those that remained was increased to $425,000,000. By 1900, the 1,000 establishments of 1880 had again decreased to 763, but the capital of those that remained had grown to over $600,000,000. During the same period the separate blast furnace establishments had also decreased. In 1880 they were 483; in 1890, 377; and in 1900, 273. This census evidence of widespread general change, readjustment and concentration by practical men in the iron and steel business would seem necessarily to have had some impelling cause—economic, mechanical, metallurgical or administrative—back of it. And in the absence of proof to the contrary, the conclusion of Mr. Roberts would seem reasonable that, "These revolutions which I have spoken of, due to the introduction of basic open hearth steel in place of wrought iron, were the fundamental reasons for the earlier aggregation of works which took place about the year 1898 and through that year down to say 1900", and that the business reason which induced practical steel men to so act was the fact that unless they did so the changed conditions of the steel business might force them out of business. In that regard the testimony of Mr. Roberts (vol. 13, p. 4951) is:

> Coming down to the year 1890, very many, if not the majority of those concerns who did not integrate sufficiently to control their supply of raw material failed in business, or were abandoned by their owners. * * * * * There are successful concerns today (p. 4953) who have not integrated in the manufacture of their own steel, but those are of a character where tonnage plays no part. Where you come to a large tonnage, however, or a comparatively large tonnage, I know of no successful concern today which has not integrated. * * * There never (p. 4956) was a year during that ten year period that there were not numerous failures in the iron and steel trade, with considerable aggregations of capital; I will say they were very numerous, so numerous that probably in some years it would amount to more than 100 failures in that period.

Light is thrown on some phases of this integrating process by the testimony of the president of the Youngstown company, whose development and expansion has been heretofore noted. He says (vol. 2, p. 732):

> "We have practically eliminated all of our scattered iron mills, have concentrated them at a few points of production, so today, we produce but little iron, and are manufacturing about a million tons of steel per annum.
>
> Q. This, I take it, is what you call an integrating process, was it not?
>
> A. Yes, sir; that was part of it, the addition of the mineral and coke and blast furnaces, and balancing up operation generally, completed the integrating process.
>
> Q. So that you were able to handle every feature of the process from the mining of the ore to the putting on the market of the finished product?
>
> A. Everything except transportation.
>
> Q. And so far as transportation is concerned, I understand you owned a fleet of vessels on the lakes to bring your ores?
>
> A. We have three vessels we own and have an interest in some others.
>
> * * *
>
> Q. You are adequately supplied with lake facilities?
>
> A. No, not quite; not balanced up. We are large carriers on the lakes in addition to our own fleet.
>
> * * *
>
> Q. I judge from your testimony that this integrating process that you spoke of attended your development of the steel end of your business; am I right?
>
> A. You are.
>
> Q. You did not need to have that so much, or at all, when you were simply manufacturing iron?
>
> A. No. It was done for economic purposes and also for trade reasons."

This testimony serves to show how radical, extensive and enforced was the steel integration, which, summed up in the few terse words of this business man, really meant a rounding-up and readjusting of everything, as the witness says—"from the mining of the ore to putting on the market of the finished product", and an increase in that company's case of resources (vol. 5, p. 1856) from $600,000 to over $23,000,000. From these figures the insistent necessity of integration in the steel business will be seen.

Coincident with these mechanical and metallurgical changes, another basic change of peculiar and dominating importance in the steel business was also taking place. This was in freight and in transportation. This change, it will be seen, not only restricted the range of a plant's market, but by doing so necessitated what might be termed locality integration. The chief factor in the manufacture of steel (vol. 13, p. 4953) is labor and the next is the locality where it is produced (vol. 10, p.3961, 3987, 3988, 4059, 4060, 4061). Being of great bulk, the transportation of the raw material to where it is made and the freight to where it is used (vol. 11, p. 4344) are the factors decisive of its being profitably made and sold. As illustrative of the vital character of freight as a factor the proof (vol. 12, p. 4815) is that the Steel Corporation uses 45,000 tons of ore alone a day, not to mention coke or limestone. The delivery of the steel to the user, and the net gain over cost received from him, is, of course, the practical test of steel making. From these self-evident business truisms it follows that the tonnage of bulky steel products restricts its steady, natural and sustaining market to the consumption of the territory near its place of production. For example, great as is the consumption of steel in the New York district, and ample as is the productive capacity of the United States Steel Corporation to supply it, yet the proof (vol. 10, p. 3782) is that the Steel Corporation does "very little business here (New York) compared with that done by the mills in Bethlehem, Phoenixville, and mills located near here." Prior to the regulation of freight rates by the government through the interstate commerce commission, freight stability was unknown. Special rates to large shippers, cuts in freight rates and secret rebates were common practices between the steel producers and the railroads, and these enabled steel manufacturers to ship bulky products into territory naturally supplied by other manufacturers, and by these cuts, special rates or rebates to dump their surplus product in districts which they could not enter if they paid proper freight charges. Thus at one time, the Illinois Steel Co. by virtue of getting a 45-cent rate from Chicago to Yokohama on export business, was able to ship rails to Japan. This freight rate (vol. 10, p. 3882) could not be had now that freight rates are regulated. The pinch and prohibition of freights in narrowing markets may be best illustrated in a letter found in vol. 11, p. 4286, where a great steel maker in 1899, said:

> The greatest blow we have received is in the rise of railroad rates and we should address ourselves to rendering these impossible. There is no reason why we cannot ship to Conneaut and to western points by boat from Conneaut and I would spend a good deal of money and a good deal of attention upon this. The mere fact that you begin shipping in that way by boat will bring railroads to their sense. I also think that something can be done shipping by Erie canal from Conneaut. I think the Lorain or somebody else put a line of boats upon the Erie and I know that a paper manufacturer of Erie does all his transportation by line of boats, which he tells me costs him about 75 cents per ton. One shipment to New York by canal would give your railroad friends much anxiety.

Market Restricted

When, however, under the regulating power of the government, freight stability was enforced the steel makers' market was at once locally restricted and his only way of overcoming the regular, stable, adverse freight rate was to integrate locally, that is, to erect or acquire other mills in the market locally from which freight forbade his heavy product entering. The embargo laid by freight on distant markets is simply a business fact, and it suffices to say that while the government by this enforced transition of the steel shipper from the era of unstable freights, cuts and rebates, to an era of freight stability, in the end contributed to corresponding benefit and stability in the steel maker's business, yet it must not be overlooked that in thus narrowing his market, the steel maker was compelled to broaden his market by expanding his operations so as to manufacture in additional localities. Coincident with this tendency to integration and to the consequent widening of variety of product and to the entry of steel into new fields, a radical change in the variety of ore supply was necessitated. In thinking of iron ore, we are apt to regard it

as simply ore, and overlook the fact that there is a radical difference in different ores. In the earlier manufacture of iron, practically any ore could be used, but as the steel era came along with its chemical tests (vol. 11, p. 4384, 4141, 4375; vol. 13, p. 4897) and the specified requirements incident to its use in varieties of articles, the particular character of the ore base became more and more a matter of importance. The practical proof of this wide range of various ores required is illustrated in the proofs, which is that even with the wide range of ores owned by the Steel Company, it is at times unable to meet the requirements of purchasers. In that regard the proof is (vol. 10, p. 3835)—

> We (the Steel Corporation) purchase a great many rails from our competitors—occasionally our people in some country will take an order for a specification which it may not be possible for us to fill. At times we have bought rails which called for Cuban ores to be used as a basis for manufacture and we bought those rails from the Maryland Steel Co.

Mixing Ores

We noted above (vol. 10, p. 3733) where 18 different kinds of billets were required in a wire mill alone. The proof is (vol. 11, p. 4375; vol. 12, p. 4813; also 4821; vol. 13, p. 4977) that it is only by a scientific mixture of different sorts of ores that steel of the large range of specified steel requirements can be made. This simple statement of a few lines, when carried into practical business operation, means the furnishing of many varieties of ores that may be as far away from a blast furnace as Minnesota, Cuba or Chili. These must be bought, mined, transported, fluxed and treated in order to meet, for example, the exacting structural requirements of a steel rail. To successfully produce that rail in great tonnage, which under the proofs is a business necessity, every step in that long-spread from the ore in the ground to the finished rail must be under the integrated control of that agency which is ultimately held responsible by the railroad for the rail. In that regard, we quote from the proofs:

> Starting from the ore fields. Individual concerns owned individual mines; no concern was sufficiently large to own groups of mines of different characteristics and qualities. All metallurgical people know that the best results are obtained by scientific mixtures of different sorts of ores, and by consolidating the ore interests of all these companies we were able to give each individual company the ideal mixtures in order to produce the most economical and best results.
>
> * * *
>
> To one familiar with the steel and iron making industries the advantages of so doing are enormous. The transportation of material affords equal opportunities to economize. Ships do not need to wait until each particular cargo can be loaded for each particular works, but can be kept moving steadily, and assigned to various works while in transit. Mills that formerly had to make a great variety of articles, by reason of consolidation are enabled to run steadily on one line, producing far greater tonnage and at very much less cost.

The result of these radical and forced changes in steel making evidenced itself in the rapid and widespread fever of integration by consolidation that took place toward the close of the century. Whether from such consolidations, monopoly, rise in prices and restraints of trade, were hoped by many of their promoters to be obtained, it would seem that the deep-lying motive which led practical steel men to put their plants into such consolidation was the recognition of the absolute business necessity of integration as a condition of staying in the steel business. Thus the Carnegie Steel Co., occupying as it did the commanding position in the steel trade, varied as were its products, having fully 70 per cent of what foreign trade there was, and having the foremost place in the home market, itself felt the necessity of and was preparing to enter on further integration by widening the variety of its product. While leading in some lines, it was deficient in others, notably pipe and wire (vol. 11, p. 4143), which consumed much of its basic products. In the minutes of that company of July, 1900 (gov't. ex., vol. 6, p. 1881, and also vol. 11, pp. 4281-2) its president stated:

> I have already expressed my views on the matter of rails referred to by Mr. Carnegie. For myself I do not see that there is anything left for us to do but to build a hoop and a wire mill. The American Steel & Wire Co. have served notice on us for cancellation of their contract with us. The American Steel Hoop Co. are buying but little from us. With the loss of customers that we have sustained, it will leave us in a position to have no four inch billets to make. There does not seem to be any other place at present to place them. The contract with the Union Steel Co. would not prevent us from going into the wire business. It is very doubtful indeed whether they would take a full tonnage from us. It looks very much as though we would have to put our steel into the finished article; we formerly sold to the constituent companies of the American Steel & Wire Co. and the American Steel Hoop Co. from 30,000 to 35,000 tons of billets per month. We have done all that we can to endeavor to get them to take their tonnage from us, but so far we have been able to accomplish nothing. I do not see how we can stop at wire rods; I think we shall have to finish the wire and nails because there are no customers for wire rods at the present time. We have figured that a hoop mill will cost about $800,000.00, a rod mill about the same amount and a mill to make barbed wire and nails would cost about $1,000,000.00, or a total expenditure to go into the hoop and wire and nail business, about $2,500,000.00.

Half Way Crossing

In a letter embodied in such minute, Mr. Carnegie said:

> I do not think that there are many customers for rods remaining and believe that if there are, they will not exist long. We should not go into rods, as I see it, unless we also go into wire. No use going half way across a stream. Should aim at finished articles only. It is coming to this in all branches.

That these minutes represented the then purpose of the company was stated by its president, who testified (vol. 11, p. 4282): "We adopted the plan at that time of building mills to finish our own steel that we had formerly sold to those companies." So also had the Carnegie company determined to integrate by adding the important item of pipes to its finished product. The purpose of this was to create for itself and in itself a customer that would use part of its product by making it into pipe. This item of steel consumption embracing oil, gas, water, irrigation and kindred fields, the Carnegie company, as we have seen, did not make. That this vast field of basic steel consumption was not sufficiently filled, is shown by the fact that they planned to spend in additions for such pipe making mills, excluding land, $12,000,000. The plans for this enterprise were entered upon in 1897 or 1898 (vol. 11, p. 4295). It will also be seen in discussing later the acquisition by the Steel Corporation of the Seamless Tube Co. that the Carnegie people were carrying on substantial experimental work at the Seamless company's plant with a view to itself entering the tube field (vol. 13, p. 4198-9). Efforts had been made to get a site near Pittsburgh, but sufficient acreage for the large works in view could not be found. Meanwhile, a site of 5,000 acres was secured at Conneaut on Lake Erie, where the company's ore steamers, coming from Lake Superior, delivered the ore to the company's railroad for transit to Pittsburgh. From this point (vol. 11, p. 4297; vol. 11, p. 4286) water transportation for pipe was available to seaboard and to the entire territory tributary to the Great Lakes. The testimony (vol. 11, p. 4297) is that this proposed widening of the Carnegie Steel Co.'s product variety to include pipe and wire products was absolutely "in good faith as indicative of the intention and purposes of the Carnegie Steel Co." In that regard the president of the company (vol. 11, p. 4390) testified:

> Q. Speaking about the purpose of the Carnegie company to go into other lines of business, and the finishing of its semi-finished product, do you remember whether the scheme talked of in the middle of 1900, as Judge Dickinson brought out from you, of building your wire mills, was persisted in to the end of the year?
>
> A. The scheme to ultimately do so was. My recollection is that the operations were deferred owing to financial conditions at that time, in our company; but the idea of ultimately extending our lines into all these finished products was not conceived in that year; it had been discussed for some years before, and plans made, and a general policy outlined for ultimately doing it.

Insistent Requirements

As evidencing not only that fact, but that it was necessary and farsighted integration—one called for by the legitimate future of the business—will appear from the fact that after the Steel Company was formed and its comprehensive plan of complete integration was carried out, that company expended $13,000,000 (vol. 10, p. 4076) in building the pipe plant which the Carnegie company in 1900 planned to build, and it will be noted further that it built it in the immediate Pittsburgh district, on ground near the National Tube Works, where the Carnegie company was not able to get the required site. All of which seems to strengthen and confirm the

conclusion of the insistent requirements of integration in the steel trade at the close of the century. The like compulsory integrating influence thus shown in the Pittsburgh district evidenced itself also in the great Chicago steel district. In that district the Illinois Steel Co. held the same commanding local position as the Carnegie company in the Pittsburgh. Its natural market was the Chicago district (vol. 6, p. 2215; vol. 12, p. 4734). It had a rail market in Canada at times which could not be reached by the Carnegie. In spite of the allegations of foreign trade made by its then management, it really had little or none, and really could have (vol. 6, p. 2215; vol. 10, p. 3829) no profitable foreign trade. Such foreign trade as it had to Canada was of the spasmodic character heretofore referred to. It had large plants at Chicago and Joliet, Ill., and at Milwaukee, and had railroad properties, but its product of basic open hearth steel was, even in 1890, only 190,000 tons, as compared with the Carnegie company's 1,250,000. It (vol. 14, p. 5505) lacked the finishing units of steel sheet, steel hoop and tin plate mills (vol. 12, p. 4735) that were afterwards acquired in pursuance of the integrating policy which the plans of the United States Steel Corporation contemplated. Practically it had no substantial wire (vol. 12, p. 4734), or structural output and no tube or pipe output at all (vol. 12, p. 4735). In 1898, the Illinois Steel Co. entered on an effort to integrate by consolidation and with foreign trade in view (vol. 18, p. 4718; vol. 14, p. 5472). In pursuance of its integrating policy, the Illinois company formed the Federal Steel Co., which took over the Minnesota Iron Co. This gave the Federal and Lake Superior ore reserve, its own railroad transportation to Lake Superior, its ore fleets to Chicago and Lake ports. It also took over the Lorain Steel Co., which gave it mills in the Cleveland district, and at Johnstown, Pa., in the Pittsburgh district, and a relative approach to the seaboard. These mills were then regarded (vol. 12, p. 4714) as enabling the Federal company to supply foreign trade from those districts. This expectation was to that extent justified, for the proofs show (vol. 10, p. 3813) that so far as their individual products are concerned the Lorain and Johnstown mills are now very substantial factors in the foreign trade developed by the Products company. But apart from these mills the Federal Steel had no facilities for entering into foreign trade and the proof is that even with all the facilities for entering such trade possessed by the Steel Company (vol. 10 p. 3828 and 3829), but 2 per cent of the product of the Illinois Steel Co. now goes into foreign trade, and that part goes, not into such general trade, but only into such Canadian markets as its location permits. The integrating steps thus mapped out are recited in the proofs (vol. 12, p. 4695), but these partial efforts at complete integration proved disappointing in that it was not complete enough. In that respect the proofs are (vol. 12, p. 4718) "the plan and organization were good as far as they went, but the organization was too small, the capital employed was too small, the facilities for finishing steel were not sufficiently diversified. We lacked finishing mills and our locations were not the best or good enough to extend foreign trade as we had hoped." Realizing these limitations, and that the Federal Steel Co.'s operations were not rounded to a successful manufacturing future, the proofs (vol. 12, p. 4721; vol. 14, p. 5473) show that steps had been taken just before the United States Steel Corporation was formed to raise from $40,000,000 to $45,000,000 in further integrating the Federal company. That such steps by the Federal company had as their real basis the bona fide commercial and industrial requirement of further integration, is, just as we have shown in the case of the Carnegie Steel Co., also shown in the Federal's case by after events, in connection with later developments in the Chicago district. The record (vol. 11, p. 4143; vol. 6, p. 2418) shows that the Federal company was not equipped to make pipe and sheets at all, and plates only to a relative small extent and had no complete line of finishing mills. It further shows (vol. 8, p. 2978) it lacked adequate open hearth capacity, did not have the money (vol. 12, p. 4762) to extend it, had (vol. 11, p. 4226) very limited structural product facilities, and even with its ore supplies it had (vol. 11, p. 4384) to buy other ores to get the proper mixtures. After the Steel Company was formed, in order to supply the needed rounding-up equipment of the Chicago district which the Federal lacked, the Steel Corporation made large editions in that district at Gary, in the center, and at Duluth, on the northern limit, with a view to reaching from Duluth the western Canadian market. In that regard the proofs (vol. 10, p. 4074) show that some $80,000,000 were spent in building at Gary open hearth plants, a rail mill, structural steel plants, bar mills, sheet mills and plants of the American Bridge Co. and the American Sheet & Tin Plate Co., in all of which facilities the Illinois and Federal Steel companies were deficient. Along the same line the proofs (vol. 10, p. 4075) show that $10,000,000 are being expended at Duluth to erect blast furnaces, open hearth furnaces and bar and merchant mills with which to supply the American and Canadian northwest. As evidencing this trend to further integration, the desirability of the Federal Steel Co. acquiring the Carnegie company, and thus integrating eastward, was in 1889 (vol. 12, p. 4722) brought to the attention of the Federal Steel Co. by a representative of the Carnegie Steel Co., who then suggested "that it would be a good thing for the Federal Steel interests to purchase the Carnegie property and perhaps with them some other properties which included finishing mills of various kinds, suggesting companies, the Wire company and the Tin Plate company and some other companies". The matter was actively taken up by the Federal company, but eventually fell through (vol. 12, p. 4723), because "Mr. Frick was not willing to agree that the whole Carnegie organization, including himself, would remain in the company and assist in carrying on the business". The proofs further show that early in 1900 Mr. Schwab, the president of the Carnegie company (vol. 12, pp. 4724-5) urged the buying of that company by the Federal and efforts were again made to have Mr. Morgan, who was a member of the board of the Federal Steel Co., take it up, which he declined to do (vol. 12, p. 4725).

Still More Integration

This demand for integration, which thus evidenced itself in these two leading companies, each attempting to integrate back to the base of supply and also into more extended and diversified finished product, also evidenced itself in other branches of the steel trade. This was the integration of mills which were large consumers of plates, ingots, billets, sheets, rods, structural iron and other semi-basic products. Without specifying all, we may refer to the steady integration of these various subdivisions of the steel trade. This began in December, 1898, when the principal tin plate manufacturies integrated by consolidation into the American Tin Plate Co. In January, 1899, the American Steel & Wire Co. was formed by a consolidation of all the leading wire product manufacturers. This was followed in February, 1899, by the consolidation into the National Steel Co. of 12 per cent of the ingot production of the country, which was located on the eastern side of Chicago and the western side of the Pittsburgh district. The same month saw the National Tube Co. formed by great concerns making various kinds of tubes and pipes. In March of the same year, sheet steel makers in large tonnage combined to form the American Sheet Steel Co., and in April of the same year the American Steel Hoop Co. was formed by the leading makers of hoops, bands and cotton ties. While the American Sheet, the American Hoop, and the National Steel were separate companies, yet for integrated, continuous working they were in effect (Topping, vol. 2, pp. 636, 684; also vol. 12, p. 4764) necessary to each other. Mr. Topping testifying: "You will remember there was formed the Steel Hoop and the American Sheet Steel. The formation of those companies, as I understood it at the time intended, was to balance up National Steel so as to make it more nearly self-sustaining. In other words, the National Steel was the raw producing steel company to supply the crude material to the Sheet Steel and the Steel Hoop and the Tin Plate companies." This integrated relation is no doubt the manufacturing feature on which it was (vol. 12, p. 4747) insisted that the finishing companies would not sell to the Steel Corporation unless the National was also purchased, as Mr. Carnegie (vol. 12, p. 4747) insisted should be done. In the same month we find the principal structural and bridge erectors and producers forming the American Bridge Co. In connection with this consolidating and integration of structural manufacturers and fabricators it is but just to note, as illustrative of compelling forces outside that industry, the demands which the business world was making upon the structural steel industry. Thus in referring to the American Bridge Co. and its carrying forward at a later date this policy of expansion and local integrating of its works, the proofs (vol. 10, p. 3961) show that such great op-

erations as the tall buildings of recent origin, such railroad work as the Hell Gate bridge, and such national work as the Panama canal, practically necessitate the existence of such companies. In that respect the proof is, railroad bridges are

* * * * confined to those companies having the largest plants and those equipped for that sort of work. There are a very few companies, for example, that could build a bridge like the Hell Gate Bridge, involving 40,000 tons of material and an incidental expense of perhaps $300,000 to get the false work together. When we secured that contract we had to expend immediately $160,000 for tools. While we were a very large concern and had a very well equipped plant, we were obliged to buy $160,000 worth of tools for that particular work. * * * * *

Q. Has there been any change in the style and size of the structures in the last 12 or 15 years which affected the size of the plants that are necessary in order to execute the contracts?

A. Yes. * * * * * * Since that time buildings ranging from 18 to 20 stories up to 36 stories have been built. * * * * * We fabricate the steel and deliver it to the site and erect it.

Bridge Plants

The proofs also show it is necessary to have structural plants in different localities. In that regard (p. 3961), and referring only to the middle west equipment, the proof is that the American Bridge Co. has in the west "a plant at Toledo, one at Ambridge (Pittsburgh), one at Gary, Ind., a large plant and a comparatively new plant; one at Chicago, one in Minneapolis, one in St. Louis and one in Detroit. * * * * * It is a zone business more or less.". A zone business is a "business within 300 or 400 miles of where the plant is located; it is a question of freight rates. Q. You mean by that, bridge business or structural business for buildings? A. Both." They further show that it requires a large plant to deliver such contract requirements, so as to coordinate with other parts of the work. The proof is (p. 3961), referring to the work done by the American Bridge Co. along the Panama canal,

"We have done about eight million dollars' worth of work there for the government so far. * * * * * * * We are building the emergency dams, building the transmission towers and the administration building and the machine shops, involving about 6,000 tons and we have been doing a great deal of work outside of the lock gates which are furnished by McClintic-Marshall Co. I think we have done the major portion of the work and it has always been work that we *had to get out pretty promptly and sometimes have to set aside other work to accomplish the deliveries required.*"

It will thus be seen that these large modern operations practically necessitate correspondingly large manufacturing facilities and financial resources to adequately and successfully meet such product demands. These rapid, widespread and isolated integrations of different sub-divisions of the steel trade cannot be reasonably explained on the sole theory of a widespread, dominating purpose in each of these aggregations to monopolize or restrain trade. In the first place, the proof is simply one-sided that they did not control trade, and that in spite of their size and their large proportions of then existing trade, their competitors, as we have already seen, have increased more rapidly than they. So that, while there may have been in the minds of those who formed them the possibility of monopoly and increase of price, we are inclined, from a study of the proofs in this case, to the belief that the real underlying influence was the economy of management, the locality of production and market, and the continuity of process which resulted from such integration. Take, for example, the last one formed —the American Bridge Co. During the years it has been a subsidiary of the United States Steel Corporation its business has increased 42 per cent. In that time its competitors have increased their business 164 per cent. During that time American company has had the help of all the associated subsidiary companies of the Steel Company; it has shared in all the economies of management, co-operation and financial help rendered by the parent company; yet with all these aids its competitors have increased their business four times as fast as its own. It would seem, therefore, that the American Bridge Co. had even less hope or power to monopolize when it was originally formed and stood alone, when it could not, when bought by the Steel Corporation, so monopolize the steel structural business of the country. In view of such facts, we have been impressed with the view that these consolidations and integrations, accomplished or in view at the close of 1900, were more largely made with a view to meeting the changing conditions in the steel trade in its transition from iron to steel and in its adjusting itself to the progress, improvement and development in that industry rather than with monopolistic intent. The proof in regard to the reasons for the formation of the American Bridge Co. fairly states, as it seems to us, the basic reasons which led to the unifying of the separate branches of the steel industry. Thus in vol. 2, p. 874, it is testified, with respect to that company's formation as follows:

A. The purpose of the formation of the American Bridge Co. was simply along the lines of economical shop management and had no reference whatever to any monopoly or to securing the entire industry of the country. The plants which became a part of the American Bridge Co. were believed to be in a position to be operated more economically as a combined whole than as independent units, and the foundation of that company was the securing of a steel works whereby they could obtain to a large extent *the control of their raw material for fabrication*, the basis of practically all structural contracts being one of time, the time of delivery being the most important factor in practically 90 per cent of all contracts taken. These independent units found themselves at that time in a very disadvantageous position, due to the fact that the large steel plants *were commencing to do their own fabricating* whereby they were enabled to control their rolling mill supplies and make such deliveries as these independent fabricating shops, having no control over the raw material, could not do.

There was also another reason for it, namely, that contracts were increasing so rapidly in magnitude that as independent units they were unable to secure sufficient working capital to enable them to fabricate these large tonnages.

You can trace from the very beginning of the securing and assembling of their raw material through the designing, fabrication, transportation and erection work, and the increase in their working capital and reasons for putting together those plants, which were of two principal characters; first they were partly competitive, I might say by reason of a greater or less similarity of output, and by reason of a common territory into which the transportation rates enabled them to ship the material, and second, plants absolutely noncompetitive, due, (a) by reason of an entirely dissimilar output and (b) by reason of their geographical location.

The whole scheme was one to decrease cost of production and to operate along the lines of what at the present time is termed scientific shop management. As a matter of fact, any advance in prices was not discussed to my knowledge; nor did any such enhancement ever take place. Competition at all times was extremely severe, and the profit on the output decreased from the time of the formation of that company until the present day. *A number of concerns were offered to the American Bridge Co. at the time of its formation, which were declined for various reasons, because they did not seem to be essential in the rounding out of the proposition that I have referred to.*

Some Futile Attempts

As we have said above, it may have been the fact that apart from the operative necessity that led to many manufacturers putting their works into these consolidations, there was probably a purpose also to monopolize and restrain trade, yet by the time the Steel Corporation was informed the inability of these prior combinations to so monopolize trade was proven to those who gave heed to facts and figures. For example, government exhibit, vol. 7, p. 2017, shows that the production in 1898 of the pig iron plants subsequently acquired by the Steel Corporation had been 46 per cent of the country's total production of 1898; in 1900 the proportion of these plants had fallen to 41 per cent. In the same way bessemer plants afterwards acquired by the Steel Corporation had fallen from 73 per cent in 1898 to 70 per cent in 1900; the bessemer rail plants had fallen from 63 per cent in 1898 to 61 per cent in 1900; wire rod plants had fallen from 97 per cent in 1898 to 82 per cent in 1900; structural shape plants had fallen from 66 per cent in 1898 to 61 per cent in 1900; plate and sheet plants had fallen from 67 per cent in 1898 to 66 per cent in 1900; while the wire nail plants subsequently acquired by the Steel Corporation which had in 1898 produced 89 per cent of the country's total production had by 1900 dropped off to 73 per cent. Indeed, as we gather the net results of these different plants in varied steel lines, the acquisition of which (1901) by the Steel Corporation is alleged to evidence a purpose to monopolize, the facts and figures show that in only one product, namely, that of ingots and castings, had there been an increase of proportion in the three preceding years by those plants, and in nine other branches, the plants which the Steel Company subsequently acquired, had in point of fact in those three years clearly shown their inability to monopolize by a decrease

of relative percentages ranging from 1 per cent in the case of plates and sheets to 16 per cent in wire nails. And that this three years' decrease in actual monopolistic control was the normal trend of the steel business is shown by the fact that such proportions continued to decrease after the Steel Corporation was formed. As an example of this tendency, we may cite the wire plants subsequently acquired by the Steel Corporation, which in 1898 had 88 per cent of the country's production and in 1890 had fallen to 72 per cent, had by 1911 so continued to lessen their proportion of the part sold in the American market that it was then but 42 per cent of the country's production.

Congressional Investigations

Moreover, these combinations were the subject of congressional investigation from 1898 forward, and the proof (vol. 28, p. 11760) is that while the results of that investigation were published, they are not in evidence before us. They have resulted (vol. 12 p. 4755) in no adverse action by the government. From all which we find former combinations were largely the support for our conclusion that these result of economic and manufacturing plans for the production of product rather than for monopolistic plans for selling product. At any rate, the proof is that as a practical business experience these combinations which existed prior to the Steel Corporation had, in the three years preceding the formation of the Steel Corporation, shown a waning power to monopolize, if any such power existed when they were formed.

We have thus seen the unifying, integrating and rounding-up influences which were irresistibly forcing those engaged in the practical work of making steel to form these prior combinations of integrating units. The proofs show that Mr. Morgan was a director in the Federal Steel Co. (vol. 12, p. 4724), but that he personally knew nothing of the steel business. His firm had taken part in some of these consolidations, but the suggestion of the absorption by the Federal of the Carnegie company had not appealed to him. The proof is (vol. 12, p. 4274) that while he was a member of the board of directors of the Federal Steel Co. and was financially interested in it, he had probably never attended a meeting of the board and taken no part in its management and knew nothing of the practical steel business.

The Schwab Dinner

The conditions in the steel trade being such as we have shown above, Mr. Morgan, in December, 1900, attended a dinner in New York, where some 80 men, prominent in steel manufacturing and the banking business, were present. This dinner was given to Mr. Schwab, the president of the Carnegie Steel Co. Whether the dinner was given for the purpose of affording an opportunity of interesting Mr. Morgan in buying the Carnegie Steel Co., which the bitter differences between the partners in that company (vol. 6, p. 2189; vol. 14, pp. 5655 and 5656) and the desire of Mr. Carnegie to retire from business, then made possible, there can be no doubt, in view of the outcome, that Mr. Schwab then gave to the bankers present, and particularly to Mr. Morgan, who was seated beside him, such a comprehensive view of the steel trade as was well calculated to show the possibility of carrying integration to its logical manufacturing and merchandizing efficiency, and afforded the Federal company, of which Mr. Morgan was a director, the opportunity to carry out on a large scale the policy of integration that company had planned and had (vol. 12, p. 4719) attempted to carry out. And there can be no doubt that Mr. Schwab realized that if a sale of the Carnegie company could be made, the grave discord among the partners of the Carnegie company (vol. 14, pp. 5655-6) which had arisen, could be ended, and the policy of integration on which, as noted above, that company had also embarked, could be carried out by some larger organization. Indeed, the evidence is clear that there was an earnest desire on the part of the owners of the Carnegie company for several reasons to sell. The situation was summed up by Judge Reed who, vol. 14, page 5655, testified:

Q. The Carnegie management was originally a partnership, I believe, was it not?

A. A limited partnership.

Q. When was it turned into a corporation?

A. In the spring of 1900, turned into two corporations.

Q. What is that?

A. Two corporations were formed at that time.

Q. What were they?

A. The Carnegie company was the holding company of the stocks of the Carnegie Steel Co., the Frick Coke Co. and the Bessemer & Lake Erie Railroad Co.; the Carnegie Steel Co. was organized under the laws of Pennsylvania, and was the operating company.

Q. What do you know of the desire of the stockholders of the Carnegie company to sell out in the year 1900?

A. I think they were all desirous to make some permanent disposition of the property, for several reasons.

Q. There had been dissensions among the partners a year or two before, had there not?

A. Yes; that is a mild word for it; there had been quite serious dissensions between Mr. Frick and Mr. Carnegie, as the leaders.

Q. Resulting in litigation?

A. Resulting in litigation.

Q. That was ended, I believe, by the organization of the corporation or corporations?

A. Ended by the formation of the two corporations of which I have spoken.

Q. Was entire harmony restored between the gentlemen by its organization?

A. No, sir; it was not.

Q. Now, did you learn from these gentlemen themselves of their desire to sell but in 1900, or from any of them?

A. Why, I could not say it was said in so many words, but I knew that it was their desire, as I say, that some permanent disposition should be made of the property for the reason that Mr. Carnegie was growing old. He had the majority interest in the company. A manufacturing company like the Carnegie Steel Co. that was intensely active could not be successfully operated with the majority interest in the hands of trustees in case of his death. He himself was anxious to get out of business and get his interest in these concerns put into investment shape, and so you can see that generally there was a desire among all of them to have some kind of a disposition made of the property during his lifetime that would be permanent.

Q. Was Mr. Carnegie giving a personal and immediate attention to the business during that time?

A. He was, but not in the sense of being on the ground. He was either in New York or Skibo, and was getting constant reports, and he was seeing the various officers of the company frequently and he was sending them advice from time to time.

Q. Skibo is where?

A. In the north of Scotland.

Q. About how much of the year was Mr. Carnegie spending there at that time?

A. About half of it.

Q. And the other half in New York?

A. In the United States; either in New York, or during the winter, in the south.

Q. But formerly, in earlier days, he had been in Pittsburgh and attended personally and actively to business, had he not?

A. I believe until about 1880, when he moved to New York.

Q. Was that so early as that?

A. Yes, I think about that time, but he was within practical reach of the business whenever he was in the United States.

Q. He could reach it by letters, could he not?

A. Yes, and telegrams.

Q. Do you know whether he was desirous of giving up even that connection with the business, aside from his desire to put his holdings in investment shape? Do you know whether he wished to be relieved of the care and attention and thought that the business required of him, and to devote his time and thought and energies to other things?

A. Yes, I think he was.

Q. What was it that he contemplated, if you know, from him?

A. What he has since done; that is, devoting himself to philanthropy and peace, and one thing and another.

Schwab's Speech

With these matters no doubt in view, Mr. Schwab made an address, as already quoted, and brought into clear relief three propositions: First, that steel making had then reached the limit of improvement in metallurgical methods; second, that further advance was dependent on integrating processes; and third, that to take care of the growing steel production a great foreign trade was possible. It is suggested that this whole talk of integration or rounding up of manufacturing facilities is an afterthought, and a mere cloak to veil a concealed purpose to monopolize trade. Let us examine what the proofs show in that regard.

Looking only at the two great companies, the union of which made possible the Steel Company, the Federal and the Carnegie, we have the fact (see statements in bill, column entitled "pleadings", pages 3 and 4) that both these companies had been themselves gradual integration growths, and their managements were then trying to integrate them further. The Illinois Steel (vol. 14, p. 5472; vol. 12, p. 4693) had entered into the wider field of the Federal; it had integrated back to ore; it was trying to integrate locally into eastern markets through Lorain and Johnstown; had considered the acquisition of the Carnegie company and had planned to spend (vol. 12, p. 4719-20-21; vol. 14, p.5473) some $40,000,000 to $50,000,000 in further broadening its field of products. For making the great basic product of open hearth

steel, which was then becoming the dominant factor in steel, the proofs (vol. 8, p. 2978) show the Federal was not equipped. The subsequent location of the great open hearth plant at Gary alone (vol. 10, p. 4074) shows the existence of the Federal's prior need of further integration without reference to the fact (vol. 10, p. 4074) that it was lacking in finishing mills for rails, bars, structural, sheets, etc. In the same way we have seen the Carnegie company was lacking in finishing plants for tubes, wire, hoops and many other finishing plants to use its sub-basic products. These patent facts and urgent needs—facts which, as we have seen, were set forth at the time in the minutes, letters and communications heretofore quoted, evidence the existence of the practical manufacturing necessity of both these great companies, either building or buying finishing mills. That such purpose of manufacturing integration should have been elaborated and formally set forth as the reason for its purchase by the Federal company of the Carnegie company would not in the nature of things be done. Every one concerned knew those facts without their being stated. It was a thing every steel man recognized so fully that no specific reference would be naturally made to it. But the proofs do show that whatever purpose was in the minds of those forming the Steel Company, integration was certainly one of the special objects in view. Thus, Mr. Schwab (vol. 11, p. 4139) makes it clear that "the economic advantages to be derived" were more enlarged upon even than foreign trade. "I might say," is his testimony, "that I enlarged and perhaps made a more strenuous talk to Mr. Morgan upon the subject of export and our ability to export, and foreign business in foreign markets than any other, *excepting only the economic advantages to be derived.*" That "the ability to export" and "the economic advantages to be derived" thus enlarged upon was integration, is shown in Mr. Schwab's testimony:

With reference to the foreign situation, I pointed out to him that up to that time our business, the steel business in general had been nominal with reference to export business; and that, in my opinion, it could only be made profitable and possible by such an organization; that *no company selling an individual line, a single line, or one or two lines, could hope to successfully compete for foreign business,* where they were not prepared to furnish the customer every line that he might require for a structure or a business; and that half a dozen or a dozen individual companies could not afford the expense or the organization to secure the talent necessary to make a successful export business, *while such a company as I outlined could.*

That this plan of integration in varied products—and nothing in excess of the required integration—was carried out is also shown by the proofs. In that regard the same witness, speaking of his visit later to Mr. Morgan, when he took him the figures at which Mr. Carnegie would sell, testified:

Q. Did you have any further talk with him at that time that you can recall?

A. We had quite some talk upon the general subjects outlined before, and I was consulted with reference to the other concerns. I had nothing to do with the negotiations for the other concerns.

Q. Who consulted you? Mr. Morgan?

A. Yes; Mr. Morgan and Mr. Bacon.

Q. Asking questions about what?

A. A great many questions relative to the other concerns, the various concerns.

Q. As to their character and business?

A. As to their character and business, and what changes would be made and how they would be operated, etc.

Q. Was there in any of that conversation any question of obtaining all the steel plants, or acquiring a monopoly or anything of that kind? * * * * * * * *

A. There was considerable discussion about the acquisition of other plants. *I advised Mr. Morgan against it, because the other plants added nothing to the efficiency of the one I proposed.* For example, plants like Jones & Laughlin, the Pennsylvania Steel Co., the Cambria, were discussed, but I said "no; they are in practically the same lines as the Carnegie company and they add no efficiency to this organization."

Q. At this time did the Federal have finishing mills?

A. They did.

Q. A sufficient number of them?

A. They had a sufficient number in their own lines.

Q. What were they lacking?

A. The Federal did not make tubes; they did not make sheets; they did not make plates to any extent, and among the things needed there were few that the Carnegie company made other than rails that the Federal company made, and as to the Tube company the Carnegie at that time did not make tubes, nor did they make wire, which the wire company made. Indeed, the addition of these plants, the general whole, was the addition of the lines that the Carnegie or the Federal have a complete line of finishing mills?

A. *No steel company had.*

Q. *None of them had?*

A. *None of them had; not nearly a complete line.*

Q. Which companies were there that you talked about as being capable of making up a complete line?

A. There was the Carnegie and the Federal and the National; and then there was the Wire, the Tube, the Bridge and the Sheet, and the Hoop company, all of which made their individual lines; and the Tin Plate company also; I overlooked them.

Q. As to the business of these companies, where was the business of the Federal principally done?

A. Mostly in the middle west.

Q. And the Carnegie?

A. When I say the middle west, I mean Chicago and west. The Carnegie, from Chicago east.

* * *

A. They made rails. They made looms and billets. You asked what they made in common. *They made blooms and billets that were supplied to other finishing companies, which they did not finish themselves.* Then the Carnegie company made a few, a very small percentage of merchant bars, and so did the Federal Steel Co.

Q. In what territories respectively, did they sell their products chiefly?

A. As I said, the Federal sold mostly in a circle of which Chicago would be the center. The Carnegie sold theirs in a circle of which Pittsburgh would be the center.

Q. What was the difficulty in trading over an extensive territory?

A. If the Carnegie shipped west of Chicago, of course they made a very great sacrifice in freights; and if the Federal shipped east of Pittsburgh, of course they made a very great sacrifice in freights.

It will thus be seen that here was a complete outline of a manufacturing plan which, if carried out, enabled the Federal company to integrate from ore to varied finished products, and this not only in the Chicago district, but through the acquisition of the Carnegie company, through the Pittsburgh district as well, and through this latter district to reach the foreign markets, which it was powerless to reach from its own district, and through acquisition of the finishing mills held by the Tube, the Sheet, the Wire, and Bridge companies to obtain the varied product facilities by which alone successful foreign trade could be built up. The testimony of Robert Bacon also shows that the whole plan turned on the possibility and advisability of the Federal buying the Carnegie company, and, if that could be effected that certain other units should be bought to provide adequate finishing plants. Thus, referring to a meeting of the Federal directors, held to consider the offer Mr. Carnegie made, Mr. Bacon (vol. 14, p. 5479) testified:

Q. Were any steps taken to get the views of the other Federal directors that day or later?

A. Yes. We succeeded in getting them in New York the next morning with the exception of Mr. Marshall Field, with whom we communicated over the long distance telephone, so that the next day we had, I believe, the opinion of all the Federal directors.

Q. How long did they remain together on Monday? The Federal directors I mean, whom you assembled?

A. Nearly all day, at different times.

Q. Was a conclusion reached that day with reference to the Carnegie offer, I mean as to whether it was wise to accept it or not?

A. My recollection is that, although it was very difficult to persuade some of the gentlemen, a conclusion was reached in principle in the afternoon.

Q. Was there any discussion that day as to how the thing would be financed?

A. No discussion as to detail.

Q. I do not mean detail at all.

A. But naturally, the supposition was that it would be financed by J. P. Morgan & Co.

Q. Do you remember whether Mr. Morgan said anything on that subject to his associate directors as to whether he was willing to undertake it, I mean?

A. Yes, my recollection is that in a very few words Mr. Morgan finally, after having heard our opinion, said that if they approved and substantiated the estimates in a general way of the business and its probable success, he would undertake to finance it.

Q. Was there any talk that day as to what, if any, other concerns should be taken over?

A. Yes; it was believed by all the men present, the directors of the Federal Steel Co., that if the Carnegie was purchased, other units should be purchased as well.

Q. And were the other units talked of and considered?

A. Yes, they were all considered.

Q. And upon what principle were they chosen?

A. Upon what principle were they chosen? I should say *upon the principle of furnishing each an essential part of a completed whole;* a new company which should manufacture all kinds of iron and steel products, owning its raw materials, facilities for transportation of raw materials to the mills and finishing plants. I think that was the basis upon which each one of these elements was considered and of course the price at which they could be acquired, based upon their actual value.

Q. Was any arrangement made on that

day or shortly thereafter for opening negotiations with the owners of the various plants that were talked of?

A. Yes. I think it was determined that day to go right ahead and see if they could be bought upon a satisfactory basis.

Q. Who was entrusted with the negotiations, if you remember?

A. I think that J. P. Morgan & Co. bore the brunt of it.

* * *

Q. What was said by the gentlemen present with respect to the objects to be attained by the organization? * * * * * *

A. It was said by all those gentlemen present, and I knew it to be their opinion, having been so closely associated with them for many years, that the object to be attained was the creation of a great new steel company, based upon the Federal Steel Co., which would be able *by the ownership of its raw material, by all* legitimate means of rail and lake transportation, *and by the ownership of finishing mills of all descriptions, both in the east and west,* to create a plant which should be able to manufacture every kind of iron and steel, and by reason largely of its ability, to reduce the cost of production and *the territorial distribution of its plants and activities, sell its products to the best advantage in every market in the world.* I know that to be the object of those men that formed the United States Steel Corporation.

* * *

A. Mr. Morgan believed that if he could take part in the formation of such a company it would be the greatest, the crowning achievement of his business career. He believed that the effect of such a creation would be upon the whole industrial fabric, the industrial life of this country, of tremendous beneficial effect, convinced as he was by Brother Schwab and the other experts that almost inconceivable results could be obtained in the way of lowering cost of production of iron and steel, that such a company would bring more good into our whole national life, constituting as it did the greatest single factor in the great constructive work of the country, than could possibly be attained in any other way. His first great object was, as I have said, by reason of the decrease in cost of production to make it possible to so improve the condition of labor by increasing wages and bettering conditions, and, by enabling the consumer always to depend upon stability of prices, to bring about a new condition of things. Those, briefly, were the ideals and ambitions of Mr. Morgan in forming the United States Steel Co.

* * *

It was said by all those gentlemen present, I believe all of them; I know by Mr. Morgan, that under no consideration would he take part in anything which was or might be considered to be a monopoly or any attempt to restrain competition. I know that that was one thing furthest from his willingness to participate in.

Referring to this meeting, Judge Gary (vol. 12, pp. 4732-4733) says:

Q. Now, what were the subjects considered by your gentlemen directors of the Federal, or owners of the Federal, at that time, and on account of which, or after considering which, you reached the resolution you mentioned?

A. The question of securing the Carnegie properties, with their ore reserves, which contained *a class and character of ore in large quantities which the Federal or the Minnesota Iron did not have,* particularly their mills for diversified products, their location and their organization, which was believed to be a very good one, and if possible, the acquisition of other companies owning finishing mills, in order to diversify the product, including the Wire company, which had been offered to us a number of times, and for the purpose, as I have said, of completing a rounded out proposition for the development of the business, extension of the business, manufacturing at lower cost, and, particularly, increasing the extent of export business.

And (vol. 12, p. 4750) he adds:

You see, in this whole plan, Mr. Lindabury, there was an effort made to acquire *properties that would be useful to each other, and by that I mean to acquire a plant that furnished certain commodities to another plant which we were acquiring, and to acquire the latter plant because it could, at good advantage, secure the products which it needed for its uses,* and so all through the line, from the ore down to the conversion from one product into another, and the final distribution of the finished product.

These proofs certainly tend to show that the practical manufacturing question of rounding out, or integrating, the Federal company, by acquiring finishing companies, was one of the objects its directors had in view at this meeting. The proofs also show that these several finishing mills were consumers of such basic products as were made by the Federal and the Carnegie and that those two companies had no such finishing mills of their own as were adequate to consume the product they made which was suitable for such mills. Without entering into the details of the proof bearing on these several finishing companies (all of which together with the comments thereon are to be found in the statement of the case, page 63, and following) we may say they fairly show that without the acquisition of each of the finishing companies named, viz., the American Steel & Wire, the National Tube, the American Bridge; the American Steel Hoop, the American Sheet Steel, the Federal Steel Co., even with the acquisition of the Carnegie, would not have been provided with adequate finishing facilities for consuming its subbasic products. And, further, without the acquisition of the first three, the Federal would lack several of the most important products (defts'. ex., vol. 2, p. 204) that have entered into the foreign trade built up by the Steel Products Co. It will also be noted that in addition to the affirmative testimony quoted above, tending to show that integration along manufacturing lines and development of foreign trade, were among the avowed purposes of those who formed the Steel Corporation, there is the negative testimony of those who took part in forming the Steel Corporation, and quoted below, that monopoly of the steel and iron business was not the purpose for which that corporation was formed. In passing on that question several things shown by the proofs are to be noted.

Monopoly Impossible

First: That with the competition left outside of the Steel Company, the extent of which has already been shown, a monopoly of the steel and iron business of the United States was simply impossible, and that no effort was made to secure these companies (vol. 12, pp. 4756-7).

Second: That in view of the fact that the proportionate volume of competitive business has increased since the Steel Company was formed, and that the proofs show no attempt by it to monopolize it to the exclusion of its competitors, to now attribute to those who formed the Corporation an intended monopolization would be to say that, having formed the Corporation for the purpose of monopoly they immediately abandoned such purpose and made no effort to accomplish it.

Third: That the publicity which the proofs (vol. 14, pp. 5669, 5585) show the Steel Company has from time to time made of its prices, its accounts and its policies, would seem a practice in line with legitimate business, rather than with illegal monopolization.

Fourth: That in carrying out the plan the advice of Abraham S. Hewitt was (vol. 14, p. 5484) taken by Mr. Morgan, and at the latter's request, Mr. Hewitt went on the board and served until his death, is a fact which, in view of the high character of Abraham S. Hewitt, tends to negative the contention that the purpose in view was to violate the law.

And, lastly, as stated above, there is affirmative testimony that no such object was in view. In that regard the testimony of Robert Bacon (vol. 14, pp. 5475-6-7) is not to be overlooked. His services as secretary of state under one administration, as minister to France under another, coupled with his selection on his retirement from business to positions of educational character, warrant this court in attributing weight to his testimony. The testimony of Judge James H. Reed (vol. 14, p. 5663), of Judge Gary (vol. 12, pp. 4753-5); and Charles M. Schwab is to the same effect. The latter (vol. 11, p. 4175) says: "From the moment when I first started my conversation with Mr. Morgan the question of our gaining a monopoly or in any way controlling the steel industry was never mentioned. My whole argument with him, as advocating this company, was the economic development of the same and the matter, to the best of my knowledge, never came up thereafter." And in this connection it is to be noted that the proofs show that the Carnegie company and the finishing companies which the Steel company acquired in 1901 were formed at various times from 1898 to 1900; that (vol. 12, p. 5754) these particular companies (vol. 28, p. 11759) were made the subject of congressional investigation; that no steps were taken by the government to dissolve such companies for the 13 years following the formation of the earliest of these companies, and 11 years from the latest until 1911; that the Steel company was also in 1905 made the subject of further congressional investigation, and that no steps were taken to dissolve it until this bill was filed.

Not Inherently Illegal

Recurring, therefore, to the particular question with which this particular part of this opinion deals, namely, whether we should now enter a decree dissolving the Steel Corporation on the ground of its original, inherent, illegal character in 1901, and whether we should also dissolve

the several constituent companies it acquired on the like ground of their original inherent illegal character when they were formed, we think there is ground for our holding in view of the facts, proofs and views above set forth, that we are not as a court of equity warranted in taking such a drastic course as to now decree the dissolution of the Steel Corporation or its constituent companies.

We are, however pointed to the subsequent acquisition by the Steel Company of several properties as being attempted monopoly or restraint of trade, and as evidencing an original purpose to monopolize and restrain. The first of such was in August, 1901, when the Steel Company bought the Shelby Steel Tube Co. Whatever may have been its motive at the outset, it is clear the purchase effected neither monopoly nor restraint of trade, for we have already seen that while, even with the acquisition of this company, the Steel Company's output of seamless tube, during the 10 years of its existence, has doubled, during the same period its competitors' sales have grown seven fold. In the light of such figures and facts we are of opinion that the acquisition was simply in the due course of normal business and indeed was but the virtual carrying out of integration plans of the Carnegie Steel Co. that long antedated the formation of the Steel Company. Without entering into minor details, we may say that no proof of monopoly or trade restraint was shown beyond the conceded fact of purchase, and the fact that the new article of seamless tubing was in some uses supplanting lapweld. We have examined among others the testimony found in government exhibits vol. 2, pp. 405-411-560-562; government exhibits, vol. 14, pp. 2902-2823; vol. 11, pp. 4198-9; vol. 13, pp. 5237-5260; vol. 17, p. 7940; vol. 13, pp. 5076-5089; vol. 12, p. 4803; vol. 13, p. 4986; Delaware v. Shelby, 160 Fed. Rep. 928; Shelby v. Delaware 151 Fed. Rep. 64; Delaware v. Shelby, 212 W. S. 580; defendants' exhibit No. 31, vol. 1, p. 166, and therefrom, without entering into details, we deduce these conclusions. The old type of tubing was called "lapweld", and made by the National Tube Co. The Shelby company made a different article called "seamless" tube. While in some ways lap-weld and seamless were in competition, yet their main uses (vol. 13, p. 5803) were not the same. The Shelby company held a basic patent involving the piercing, at an early stage, of the billet from which the seamless tube was drawn. Before the purchase of the Carnegie Steel Co. by the United States Steel Corporation, the former company, in pursuance of its purpose to enter the pipe business, was carrying on some experimental work in seamless tube making at the Shelby company's plants, and its management had become convinced that the Shelby method was the proper one. Meanwhile the National company had also determined to enter the seamless tube field and to that end had bought the Standard company. The latter made seamless tube under a patent granted to two former employes of the Shelby company. Its business in the seamless tubes was (vol. 13, p. 5083) very small, and it had (vol. 19, p. 7940) previously tried to consolidate with the Shelby company. Much patent litigation had resulted, the National company carrying on the contest for the Standard company. When the Steel company was formed, two divergent views were thus presented by the managements of two of its units. The National Tube, represented by Mr. Converse (vol. 13, pp. 5243-4) contended the Standard's process and machinery was the proper mode of seamless tube making. The Carnegie company, represented by its president, contended the Shelby method was the proper one. The determination of the matter seems to have been made by two directors of the Steel Company who had taken no part in the contest between the National Tube Co. and the Carnegie Steel Co. Their testimony (vol. 13, p. 4986, and vol. 12, p. 4803) is that they became convinced that the patent of the Shelby company controlled the situation. That company would only sell its patent, however (vol. 12, p. 4805), if the Steel Company also bought its plant. Such purchase the Steel company made in order to get the patent. In view of the fact that the Shelby patent had been sustained by the courts, that the Steel Company on its purchase abandoned the machinery used by the Standard company, and has since manufactured under the Shelby process, we are satisfied that the acquisition of that company was an ordinary purchase and had no other purpose than to acquire and use the legal monopoly which the Shelby company had obtained from the government by its patent. And a purpose to restrain and monopolize the pipe business is negatived by the fact that no monopoly has resulted and that pipe (vol. 11, p. 4481) sells for $20 a ton less than when the Steel Company was formed.

Purchase of Union Steel Co.

The next matter in the line of alleged monopoly and trade restraint was the purchase by the Steel Corporation of the Union Steel Co. in December, 1902. The testimony bearing on that question on the part of the government will be found at volume 3, pages 1086 to 1137; vol. 5, pages 1997 to 2009; vol. 6, pages 2141 to 2218; government exhibits, vol. 4, pages 1583, 1574; vol. 5, page 1883; and on the part of the Steel Company in volume 14, page 5666; vol. 12, p. 4086 to 4810; vol. 10, pages 4037 to 4038. Without here discussing the testimony on the part of the Steel Company, we may say that the proofs on the part of the government show that this sale was not made with any purpose of monopoly or trade restraint. The Union Steel Co. had merged with the Sharon Steel Co. John Stevenson Jr., who was the practical man in the Sharon company, testified that such competition as there was between those companies and the defendant Steel Company was fair: "I liked the competition. If you are bound to have competition, theirs was good competition." He said he sold out his interests in the Union company because he needed the money; that he had put more money into the enterprise than he owned and was hard up; that the effort to sell came from his company; that the sale was made on fair terms, cost and accrued profits. Their ore holdings were very valuable, had been definitely ascertained by spot borings, were owned in fee, and were sold in place at a price based on the common ore royalty. He says that at the time of the sale the Union was only one of a number of competitors, all of whom were flourishing and doing an increased business, such as the Pennsylvania, Cambria, Bethlehem, Lackawanna, the Republic and Jones & Laughlin. That his company's business with relation to the country's total production was less than 2 per cent, and that the Steel Company's percentage had decreased, and its competitors' percentage had increased, during that time. The testimony of Mr. Whitla, one of Stevenson's associates is to the same effect, namely, that the competition of the Steel company was fair and that the business of the Union company had grown to such an extent as to interfere with his own and some of his associates. That the sale was made at a fair price when the opportunity came to withdraw. To the same effect is the testimony of W. H. Donner. He started the Union Steel Co., was its practical man, and after the sale re-entered the steel business as president of the Cambria Steel Co., one of the principal competitors of Steel Company. He says the Union company, after its merger with the Sharon, had large ore reserves of very desirable quality; that they had valuable Lake frontage harbor lands; fine coking coal reserves; that they had large open hearth facilities (vol. 12, p. 4806), in which the Carnegie company was short. That they also had finishing mills in which the American Steel & Wire Co. were short and which it needed (vol. 12, p. 4807; vol. 10, p. 4037), in foreign trade; that these finishing mills were adapted to using bessemer steel, with which steel the Carnegie company was over-supplied. That the Carnegie company (the Steel Company's subsidiary) had an over-capacity of bessemer and an under-capacity of open hearth is conclusively shown by the subsequent integration of the Steel Corporation at Braddock (in the same district as the Union) where $11,000,000 was required in open hearth extensions. In that regard the proof (Farrell, vol. 10, p. 4077) is:

> **We are building at Pittsburgh a new steel works, a rail mill at Braddock, Pa., with a capacity of 750,000 tons a year of open hearth steel. That is, to take up the rail business. This bessemer equipment is obsolete; that is, the equipment is just as good as new, but the demand does not exist, so consequently we cannot employ it, and it necessitates producing steel that is required by the buyers. We are spending there about $11,000,000.**

Donner's Testimony

Donner says the movement to sell came from the Union company and not from the Steel Company. That he knows the Steel Corporation people were at first opposed to buying and only changed their minds when shown how the Union would supply, as above stated, the features in which the former was short. That in order to in-

duce the Steel Corporation to buy, the Union company was obliged to cut down their ore prices a million and a half dollars below what these properties had been valued at when his company and the Sharon merged. That of the four men in the original Union company, he was in favor of selling in order to get out of debt, one of his associates was very anxious to sell and in fact brought about the sale, because he was in an embarrassing position, because his connection with both the Union company and the Steel Company prevented him from taking part in the affairs of either. That his other two partners were opposed to selling and only acceded to it on account of their personal relations to the partner who desired the sale. Without here detailing the defendant's testimony at length, which we may say corroborates the foregoing, we are of opinion that the purchase of the Union company was a natural and normal acquisition incident to the growth, increase and needs of the Steel Corporation's business, and was not done with a view to monopolizing the steel business or to restrain trade by eliminating competition. And we may say that this conclusion is in accord with the subsequent acts of the Steel Corporation. The proofs show (vol. 10, p. 4037) that some two and a quarter million dollars was spent by the Steel Corporation to further increase the Union wire plants and meet the needs of the Corporation's foreign business. The whole wire capacity of the Union's wire plants (vol. 10, p. 3845) is now being operated to the capacity of 83,000 tons of wire for foreign trade as against 8,000 when it was bought. In connection with the work of these finishing mills, about a milllion and a half dollars were spent in open hearth construction by which the finishing mills and furnaces—blast and open hearth—were integrated into a continuous process. Indeed, the need of this plant to carry out the general unification problem of the Steel Company is shown by the fact (Donner, vol. 6, p. 2185) that subsequent to its purchase of the Union Steel Co. the Steel Corporation spent nearly $7,000,000 in extensions in view by the Union, and $10,000,000 in extensions planned after the purchase.

The Clairton Purchase

We next turn to the acquisition in May, 1904, of the Clairton Steel Co. The Crucible Steel Co. was engaged in the manufacture of tool and the finer grades of steel (vol. 13, p. 4953), which the Steel Corporation did not make. In the spirit of complete integration which swept over the steel trade, the Crucible company, as the sequel clearly shows, had in 1902, mistakenly, through the Clairton company whose stock it owned, gone into ore ownership, furnace open hearth, bloom, billet and slab integration on a scale far beyond its own requirements. In January, 1904, the Clairton company had become insolvent and passed (vol. 5, p. 2059; vol. 14, p. 5669) into the hands of a receiver. The proofs (gov. ex., vol. 2, p. 599; vol. 14, p. 5587; vol. 12, p. 4814; vol. 13, p. 5236) show that several efforts had previously been made by the Crucible Steel Co. to sell the Clairton company to the Steel Corporation. That company declined to purchase. After the receivership, the negotiations were resumed with it and other interests (vol. 5, p. 2061) and the property sold to the Steel Company with the permission (vol. 5, p. 2061) of the court at $4,000,000 below cost. Clairton had a pig iron capacity of some 420,000 tons. It had (vol. 12, p. 4814 and vol. 13, p. 5236), through its type of furnace construction, been able for the first time to make pig iron from Mesabi ores without any mixture of old range ores. In connection with this sale it should be here stated as a matter of which this court cannot but take judicial notice that the receivership of the Clairton company and the sale of its property was under the direction of one of the judges now sitting in this case. That the bonds of the insolvent company were guaranteed by the Crucible company, that while the latter company was and has since been prosperous, the guaranty by it of the Clairton company's bonds seriously threatened not only the stockholders of the Crucible company, as testified to in this case (vol. 13, p. 5669), but grave financial troubles in the community. To avoid these, the receivers, under the direction of the court, and in co-operation with the officers of the Crucible company, sought to have the Steel Company buy this plant and thus relieve the Crucible company of its large and threatening collateral liability.

The Hill Ore Lands

The next of these acquisitions by the Steel Company, which it is alleged was made to monopolize or restrain trade, is known as the Great Northern ore lease, which was a lease on royalty of some 39,000 acres of Lake Superior ore lands, in August, 1907. This lease provided for the payment of a minimum royalty of 750,000 tons to be mined in 1907, 1,500,000 tons in 1908, and an increase of 750,000 tons each year until 8,250,000 tons was reached in 1917. That yearly amount was then to be taken out until the lease ended in 50 years. The royalty was, using round figures, $1.17 per ton on 49 per cent ore; $1.21 on 50 per cent, and $1.98 on 66 per cent ore, with an increase of 3.4 cents per each year on all grades. The lease provided the Steel Company had the option to cancel it as of Jan. 1, 1915. During that time the lessee had full rights to test the premises. In pursuance of such right of cancellation, the Steel Company early in 1911 and prior to the filing of this petition, gave notice of cancellation in pursuance of which the lease was subsequently surrendered. It will thus appear that whatever effect the leasing and continued control of this ore on the fact of the monopolization of ore reserves may originally have had, the surrender of the lease lessened the ore holdings of the company to a point far below any possibility of monopolization. A discussion by us of the question of the possible effect of this lease as giving monopolistic control would be problematical and the uncertain character of any conclusion is best emphasized by the essentially different status of the ore business now and when this lease was made. This is due to the subsequent development of other fields and to the fact that ores which a few years ago were looked upon as not usable, can now be used under new methods. Moreover, the facts cited in the former part of this opinion in reference to the ore supplies of the competitors of the Steel Corporation show not only that several of these large companies have a reserve for more years than the Steel Corporation; that the seaboard companies are wholly independent of the Lake Superior regions; and that the Steel Corporation's competitors have from time to time been able to acquire all additional ore reserves desired. In addition to this, we have the fact of large holdings by mining companies, who sell ore and who have been compelled (vol. 16, p. 6548 and 6544) to integrate into blast furnaces in order to dispose of it. The proofs of experienced witnesses (vol. 16, p. 6232; vol. 17, p. 7012) are that adequate ore reserves could be had by new companies. In view of these facts and proofs and of the fact that the option to cancel the ore lease here in question had been exercised when the present petition was filed, it would seem that the ore reserve of the Steel Corporation held at that time gave it no monopoly in ore. Such being the case, the ore lands in question having reverted to the owners, they and such defendants as were made parties to this cause by virtue of their relation to the acquisition of such ore lands, appear to have no further part in this cause. So far as they are concerned, the petition will be dismissed.

The Tennessee Purchase

We shall next consider the purchase of the Steel Company of the Tennessee Coal, Iron & R. R. Co., which was made in November, 1907. On the one hand, it is alleged the Tennessee company was a competitor of great power and that its purchase was for the purpose of suppressing competition and effecting monopoly and restraint of trade. On the other hand, it is contended that the competition of the Tennessee company was of relatively small extent, that its purchase was practically forced upon the Steel company as a means of averting a threatening financial crisis during the panic of 1907, and that such purchase neither did, nor tended to, monopolize or restrain the steel and iron industry of the United States. Without here entering upon a detailed analysis of all the proofs, we may say that we have specially studied, in addition to other proofs, the evidence produced by the government and found at—Buell, vol. 1, pp. 15 to 34; Topping, vol. 2, pp. 643 to 671 and 686 to 718; Perrin, vol. 2, pp. 792 to 982; same, vol. 3, pp. 983 to 997; also 1005 to 1008; also 1016 to 1019; also 1024-5; government exhibit No. 90, vol. 1, p. 242; government exhibit vol. 2, pp. 488, 493, 510 and 544; Corey, vol. 8, pp. 2973 to 2975; also pp. 3045 to 3056; Grasty, vol. 8, pp. 3140 to 3153; government exhibit No. 341, vol. 8, p. 2132 (in that connection see Topping, vol. 2, pp. 706, 709, 712, 714, 716 and 755); also government exhibit, vol. 2, pp. 488, 492, 510; and also the testimony produced

by the Steel company, to wit:— Filbert, vol. 14, pp. 5591 to 5593; Farrell, vol. 10, pp. 4018, 4020, 4021, 4024, 4028; Witherbee, vol. 18, pp. 7287 to 7290; Bowron, vol. 25, pp, 10415, 10431, 10440, 10442, also vol. 20, p. 10408; Crawford, vol. 16, pp. 6125 to 6178; Burr, vol. 27, pp. 11573 to 11588; King, vol. 25, pp. 10249 to 10260; Hass, vol. 20, p. 8316; Farrell, vol. 10, p. 3881 — defendants' ex. No. 12, vol. 1, p. 138; bearing on the question of monopoly and trade restraint as contended for by the government and have arrived at the following conclusions. At the time the Steel company bought the Tennessee company, the latter's production of iron and steel was 1.7 per cent of the production of the country. That up to that time, the Tennessee company had not been a business success; that it was making rails, which was its principal steel product, at a loss; that its ultimate success was problematic; that such success involved an outlay of upwards of $25,000,000 to put it upon a dividend basis. That it had never really earned any dividends up to the time of its sale; that the whole testimony shows its relation as a successful, substantial competitor with the Steel company in the volume of its business, the character of its product and the breadth of its market, was negligible. We are warranted by this testimony, and find the fact to be, that its purchase by the Steel company in no way tended to monopolize the steel and iron trade, and that it was not bought with the purpose, or intent, of monopolizing, or attempting to monopolize or restrain that trade. Such negative conclusions and findings are confined by the affirmative proofs showing just how the purchase was made, namely, as a necessary part of comprehensive plans of bankers and business men, sanctioned by President Roosevelt, to check the panic of 1907, which was then at its height. Without entering into details, we may say the situation was summed up in the letter of President Roosevelt to Attorney General Boneparte, found in government exhibit, No. 339, vol. 7, p. 2125, as follows:

Roosevelt's Letter

November 4, 1907.

My dear Mr. Attorney General:

Judge E. H. Gary and Mr. H. C. Frick on behalf of the Steel Corporation have just called upon me. They state that there is a certain business firm (the name of which I have not been told, but which is of real importance in New York business circles) which will undoubtedly fail this week if help is not given. Among its assets are a majority of the securities of the Tennessee Coal Co. Application has been urgently made to the Steel Corporation to purchase this stock as the only means of avoiding a failure. Judge Gary and Mr. Frick inform me that as a mere business transaction they do not care to purchase the stock; that under ordinary circumstances they would not consider purchasing the stock because but little benefit will come to the Steel Corporation from the purchase; that they are aware that the purchase will be used as a handle for attack upon them on the ground that they are striving to secure a monopoly of the business and prevent competition—not that this would represent what could honestly be said, but what might recklessly and untruthfully be said. They further inform me that as a matter of fact the policy of the company has been to decline to acquire more than 60 per cent of the steel properties and that this purpose has been persevered in for several years past, with the object of preventing these accusations, and as a matter of fact their proportion of steel properties has slightly decreased, so that it is below this 60 per cent, and the acquisition of the property in question will not raise it above 60 per cent. But they feel that it is immensely to their interest, as to the interest of every responsible business man to try to prevent a panic and general industrial smash-up at this time, and that they are willing to go into this transaction, which they would not otherwise go into, because it seems the opinion of those best fitted to express judgment in New York that it will be an important factor in preventing a break that might be ruinous; and that this has been urged upon them by the combination of the most responsible bankers in New York who are now thus engaged in endeavoring to save the situation. But they asserted they did not wish to do this if I stated that it ought not to be done. I answered that while of course I could not advise them to take the action proposed, I felt it no public duty of mine to interpose any objection.

Sincerely yours,

Theodore Roosevelt.

When called by the government as a witness, President Roosevelt, (vol. 8, pp. 2903 to 2908) testified as to this letter as follows:

"I was dealing with a panic, and a situation where not merely 24 hours, but one hour, might cause wide-spread disaster to the public. * *

I ought to say that from New York I had been told by banker after banker that the Tennessee Coal & Iron securities were valueless as securities that counted in that panic. * * * * *

There were two matters to which my attention was especially directed. One was the condition of things in New York, the relief that the action would bring, not merely to New York, but throughout the entire country—just as much in Louisiana and Minnesota and California as in New York. That was one thing. The other thing to which my attention was particularly directed was the percentage of holdings the Steel Corporation had, and had had and would have after the Tennessee Coal & Iron properties were acquired. * * * * *

The knowledge that I had was that the Steel Corporation had some years previously possessed nearly 60 per cent of the holdings of the steel industry in the country, that its per centage had shrunk steadily; that the addition of the Tennessee Coal & Iron Co. which was something in the nature of four per cent, somewhere between two and four per cent, I have forgotten the exact amount, somewhere around there, did not bring up the percentage of holdings of the Steel Corporation to what it had been a few years previously. * * * *

My knowledge was simply this, that it was a matter of general opinion among experts that the Tennessee Coal & Iron people had a property which was almost worthless in their hands, nearly worthless to them, nearly worthless to the communities in which it was situated, and entirely worthless to any financial institution that had the securities the minute that any panic came, and that the only way to give value to it was to put it in the hands of people whose possession of it would be a guarantee that there was value to it. * * * * *

I believed at that time that the facts in the case were as represented to me on behalf of the Steel Corporation, and my further knowledge has convinced me that this was true. I believed at the time that the representatives of the Steel Corporation told me the truth as to the change that would be worked in the percentage of the business which the proposed acquisition would give the Steel Corporation; and further inquiry has confirmed to me that they did so. I was not misled. The representatives of the Steel Corporation told me the truth as to what the effect of the action at that time would be, and any statement that I was misled, or that the representatives of the Steel Corporation did not thus tell me the truth as to the facts of the case, is itself not in accordance with the truth."

Roosevelt Stated Facts

An examination of the testimony, viz.: letter of the Attorney General of the United States of Nov. 4, cited by the President, vol. 8, p. 2907; Gary, vol. 12, pp. 4834 to 4866; Tierney, vol. 4, pp. 1559 to 1587; Thorne, vol. 3, p. 1276; Topping, vol. 2, p. 695; Corey, vol. 8, p. 3052 and 3054; Gayley, vol. 9, p. 3618; Ledyard, vol. 15, pp. 6065 to 6114; shows that the matter was as stated by the President and that the Steel Corporation's chairman absolutely refused to purchase (vol. 12, p. 4854), unless the matter was submitted to the government authorities, his testimony in that regard being,—

While the President of the United States could not say that we might purchase this, or that we should not purchase this property, yet I believed, inasmuch as he had the general direction of the law department of the United States, certainly we ought to know what would be the attitude of the administration in case we did buy this property.

Indeed as to this purchase as well as the others which we have discussed above, sales made under different circumstances and for various reasons, we cannot but feel in the light of the proofs that they were made in fair business course, and were, to use the language of the Supreme court in the Standard Oil case, "The honest exertion of one's right to contract for his own benefit, unaccompanied by a wrongful motive to injure others."

Price of Rails

It is strongly urged that the fact that standard bessemer steel rails have for a long series of years, covering indeed the whole life of the Steel Corporation, been sold at the uniform price of $28 per ton, shows some controlling influence, and, in connection with the proofs, evidences the existence of a combination among all rail mills including the Steel Corporation, to control the price. Generally speaking, railroad rails are as to their basic character either bessemer or open-hearth. Bessemer was the earlier development, and of this type is the standard bessemer rail which has kept the above uniform price. The proofs show (vol. 10, p. 4049) that about 30 per cent of the rails sold are of this kind, the consumption having fallen (defendent's exhibit, vol. 3, p. 323-4) from 99.9 per cent in 1901, to 33 per cent in 1912. As we have said, the proofs show that these standard bessemer rails have been almost uniformly sold at $28, though there is some proof (vol. 26, p. 10942) that they were at times sold for less. The open-hearth rail is a later development; it has largely superseded the standard bessemer, constituting (vol. 10, p. 4051) 60 per cent of the rail product. It ordinarily sells (vol. 10, p. 4960 and

4050) at from $1.50 to $2 per gross ton higher than the bessemer standard rails, and the price of such open-hearth rails varies (vol. 13, p. 4961) according to specifications. This is so (vol. 10, p. 4050) "because many open-hearth rails are made to special analyses, the chemical composition is different, due to the fact that some railroads insist upon greater physical tests than others, which, of course, while the open-hearth process is the basic operation, nevertheless we call them different qualities of rails." The other 10 per cent of rails consists of alloy or electric rails, the cost of making which (vol. 10, p. 4051) is $40 per ton; nickel alloy rails which vary (vol. 10, p. 4051) from $34 to $60 per ton; and manganese, which sell from $100 to $130 per ton, depending on chemical analysis, they being especially made to serve for work on curves, under the shade of bridges and other such trying places. It will thus be seen there is a wide variation in the character and price of the great bulk, namely, of 70 per cent of the country's rail product, and that the standard bessemer rails which it is alleged evidence price control, are in fact but 30 per cent of the total rail consumption. The testimony (vol. 13, p. 4959) throws some light on the uniform price on this remaining 30 per cent of the standard bessemer rails, namely, that $28 a ton is a foundation price from which the price of other rails, varying in specification and chemical requirements, can be figured. Another cause of price uniformity in rails, the proof (vol. 13, p. 4960) shows is due to the change about 1900 in reference to freights; "Prior to 1900, there was an opportunity to bargain for transportation which was at no definite, fixed price. Since 1900, by government regulation railroads can no longer trade in transportation at varying figures." The extent to which special freight rates in the sale of rails prior to 1900 is illustrated by the incident elsewhere referred to, where the proofs (vol. 10, p. 3882) show that a special freight rate of 45 cents led to sales of rails being made from Chicago to Japan. The proofs also show that the real potential control over the price of rails is rather in the buyers than the makers of rails. Reflection will show why this is so. Freight rebating being out of the question, the price of a rail becomes purely a manufacturing question. A railroad is not compelled to buy its rails at once. It can defer its purchases, and the proof is that when a large railroad like the Pennsylvania (vol. 13, p. 4958) or the New York Central (vol. 12, p. 4910) gives an initial order to one rail company, that sets the price of rails for other rail companies. At the argument of this case, in response to inquiries by the court, it was stated that the Pennsylvania railroad was a large stockholder in the Pennsylvania Steel Co., to which company reference was made in the first part of this opinion. Such being the case, it would seem as a business proposition that that railroad would be quite independent of any exaction in rail prices. And the fact and significance of this independence may be well connected with the proof that in the previous era of destructive rail price cutting there had been by means of such price cutting an intent to drive the Pennsylvania out of business, and that company had been forced into a receivership. But whatever may have been the rail pool practices prior to the formation of the Steel Corporation, and in the earlier years following its formation to restrain or obstruct the rail trade, the proof in this case shows that in 1900 a new method of rail buying was begun and was for some years prior to the filing of this bill prevailing between the railroads and the five or six companies that make rails. In that regard, Percival J. Roberts, who was a director of the Pennsylvania railroad, testified (vol. 13, p. 4957):

> During the presidency of Mr. Cassatt of the Pennsylvania railroad, about the year 1900, he inaugurated a system for the Pennsylvania railroad, of making his purchases yearly at about the end of each calendar year for the succeeding one, and also proportioning his orders among the various rail mills, somewhat along the lines of their respective freight tonnages; (see vol. 10, p. 3996) not exactly accurately in regard to the latter point. This was done partially from the fact that they established a system of yearly budget for their ensuing year's work, and they did it for the reason that they desired as far as possible to give uniform treatment to manufacturers along the lines of their road. Prior to that time, purchases of rails were made from time to time as requirements might warrant; many of the other leading railroads in the country, upon the inauguration of this policy, pursued the same, so that from that period on, rails have usually been bought within a very few months covering the entire subsequent year. This is a distinct change from the method of handling this business prior to 1900.

The practical working out of this plan is shown in the proofs (vol. 13, p. 4050) and discloses the fact that while the standard bessemer rail still keeps to a standard price, there is a difference in non-bessemer, which latter rails with alloys, nickel and manganese rails, constitute 70 per cent of the product. These non-bessemer open-hearth rails "are made to special analysis, the chemical composition is different, due to the fact that some railroads insist upon greater physical tests than others, which of course, while the open-hearth process is the basic operation, nevertheless we call them different qualities of rails." In describing the method of arriving at the rail price of the four different years of 1910, 1911, 1912 and 1913, Mr. Farrell, president of the Steel company, and Mr. McCrea, president of the Pennsylvania railroad, themselves fixed the price for the special rails sold to that company. The former (vol. 10, p. 4052), says:

> Most of the large trunk lines have their own specifications. The Pennsylvania Railroad Co., for example, buy about 250,000 to 300,000 a year. They have their own rail specifications prepared by their engineer. We charge them for their rails $30.55 a ton, which we consider a fair price for rails of that specification. * * * * * * * We tried to get a little more. In this instance, we figured those rails ought to net us $30.85 a ton, but Mr. McCrea talked to me about the thing and said, "now I think we might shade this a little bit," so that finally it was just a question of merchandising, two people sitting down and trading across the table, the seller giving the best price he could and the buyer getting the best price he could, and we received $30.55. We make these special qualities of rails for a great many people.

It will also be seen from other proof (vol. 11, p. 4145) (vol. 26, p. 10834), that the fact of a rail mill being situate on the line of a railroad is naturally a large element in securing it as a rail buyer. Indeed, a study of the testimony—from which we refer to—Shook, vol. 25, p. 10491; Welburn, vol. 26, p. 10937; Schwab, vol. 11, p. 4162, 4327, 4387; Smith, vol. 19, p. 7940—satisfies us that whatever may have been the practices of rail pools, combinations, etc., prior to 1900, and during possibly some of the earlier years of the Steel Corporation, the dealings between the railroads and the rail making companies have been of later years on a competitive basis, individual railroads dealing with individual companies. The policy of the Pennsylvania Railroad Co. of distributing the railroad's annual requirements on the basis of the freight furnished by each mill, would seem to have put an end to the trade wars between rail mills when rails were sold below cost, Roberts, vol. 13, p. 5015, Scranton, vol. 8, p. 3200 and companies were driven into or threatened with bankruptcy. The proof is explicit (vol. 11, p. 4162) that $28 has for years been accepted by the railroads as a fair base price for rails and that they have asked no reductions. There is no proof that such price is unfair and the proof (vol. 11, p. 4165) is that the mill cost of rails is from $22 to $23 per ton. The testimony of one large rail maker (vol. 11, p. 4162) that in his judgment rails are too low, has support from the fact testified to by the president of the Republic Iron & Steel Co., who says (vol. 28, p. 12002):

> We quit manufacturing rails because there is no money in making them. * * * * (p. 12018) I came into the Republic company in 1906, and we had, according to my recollection 50,000 to 60,000 tons of rails on our books which I did not care to produce. I saw possibilities of making money on something else; so I replaced those contracts; in other words, I bought the rails from other producers, and satisfied my contracts, and changed the rail mill into a sheet and tin bar mill. That was in the early part of 1907, according to my recollection or the latter part of 1906.

To the above manufacturing cost must be added over-head, interest and depreciation. The general nature of the last item, particularly in the change from bessemer (vol. 10, p. 3857) to open-hearth, we have already seen. The proofs (vol. 8, p. 3034) show that for several years the price of rails, $28 has been lower in this country than in France, Germany, Austria, Italy and Russia. It will also be noted that the practice of re-rolling rails, an industry that has lately sprung into existence (vol. 10, p. 4028) and grown to large proportions, enables railroads to have their old rails re-rolled into lighter sections, has, in its simple mills, created another factor by which the railroads can protect themselves. It would seem, therefore, that on the whole, the weight of these proofs would tend to show that at the date of the filing of this petition the price of $28 at which the standard bessemer rail was selling, was not chargeable to the Steel company as a violation by it of the statute here involved. Indeed, in connection with

the continuance of this uniform price of $28 for standard bessemer rails which as quoted elsewhere in this opinion was testified (vol. 17, p. 7909) as being tactily accepted and continued by the sales managers of different rail companies, we can readily see how rail manufacturers simply followed that basic price to prevent the ruinous rail wars of the past. In that regard, one of them (vol. 11, p. 4387) testified:

> There is not a manufacturer of rails in the United States today, I for example as a rail manufacturer, feel that if I were to vary that price of $28.00 for rails, which seems to have been recognized by all rail manufacturers as a fair price and giving a fair profit, if I were to vary that ten cents a ton, I would precipitate a steel war, to use such a word or expression, that would result in ruining my works without any profit. Everybody by tacit and mutual understanding felt the same about that. * * * I would not vary the price of my rails under any circumstances, not if I knew it was to get 100,000 tons in orders, for the reason that my competitor next door would put the price down $1.00 a ton, or $0.50 a ton, even, and we would be in a position where we would be running without any profit at all.

Not Unlawful Restraint

Under all the evidence bearing on this subject we cannot regard the uniform price of $28 as the generally accepted price of a standard bessemer rail evidences an unlawful restraint or control of price by the rail makers of the United States.

The Gary Dinners

We take up next the subject of the "Gary dinners", which (as already stated) we have reserved for separate treatment. We use the term to cover a comparatively short period, beginning at an exceptional business situation and continuing until normal conditions were re-established. These dinners—which were business meetings with a social aspect—began in November, 1907, and were held at irregular intervals during the next 15 months, and perhaps a later date. We speak of a later date, because the government understands the term to cover committee meetings also with some other gatherings, which were held infrequently until early in 1911. Probably it will be sufficient to say, that, whether the period was longer or shorter, the element that marks it and calls for consideration now is what may be called the "co-operation" of the Steel Corporation with a large number of independent competitors, who, it will be noted, are not made parties to this bill and who comprise some 45 per cent of the steel and iron industry of the United States. This is the only instance of such co-operation, and the whole movement was exceptional. There is some dispute in the briefs concerning the essential characteristics of these meetings, but in our opinion the real facts appear with sufficient clearness.

We may begin the discussion by quoting the government's concession in the original petition,—"It is not here alleged that merely assembling and mutually exchanging information and declaration of purpose amount to an agreement or a combination in restraint of trade." With this concession we are in full accord. In these days, every large business has its societies and associations, and these meet periodically to exchange information of all kinds, to compare experiences, to take note of improvements in machinery or process, to discuss problems, to discuss problems, and generally to profit by the interchange of ideas and the study of observed facts. When the business is manufacturing, of course, all this has a direct bearing on the subject of prices, and these conferences may therefore consider that subject specifically. It is probably unusual, however, to find such a meeting making a declaration of intention to charge such and such prices, although a mere declaration to that effect could hardly be regarded as unlawful. Freedom of speech and freedom of individual action are justly prized in American society, and no legislation forbids men to come together and speak freely to each other about every detail of their common business. And if each individual should choose to announce at such a meeting the specific price he intends to charge for his wares, we are aware of no law that forbids him so to do. But at this point we approach debatable ground, for an individual is permitted to do some things that are denied to an association of individuals, and where at a meeting of many persons some action is taken whose legality is afterwards called in question, the decision may be vitally affected by ascertaining the fact whether the action was really taken by each individual acting for himself, or whether those present were in fact pursuing a common object.

Gentlemen's Agreements Illegal

This country has always been committed to the principle of fair and real competition in business — the struggle between individuals to sell goods in a market free from artificial control or influence—and the Sherman act merely repeats this principle when it condemns in the first section "every contract or combination in restraint of trade." When, therefore, individuals or corporations make distinct contracts with each other, either in the form of pools or other agreements, dividing territory, limiting output, or fixing prices, there can be no question about the illegality of such contracts. And it makes no difference whether or not the agreement attempts to fix a penalty for its breach. The essence of the offense is the agreement; the penalty is merely an incident; so that a so-called "gentlemen's agreement" to divide territory, etc., is quite as illegal as a formal pool with a formal penalty. In a gentlemen's agreement the sanction is the sense of honor, the moral obligation, the indefinite but real force that in some instances compels persons to keep their promises simply because they have promised.

But suppose what happens is this; a number of persons take no action about territory or output, their discussions being mainly concerned with the subject of prices; and suppose further that they refrain from making a definite formal agreement, and limit themselves to an understanding, a declaration of purpose, an announcement of intention—what then is to be said? Have they offended against the law? This question cannot be answered until we know what the participants were really doing. It is not enough to rest upon the varying names that may be given to the transaction. It is of the utmost importance to know how these names are to be interpreted, and this is the crucial matter to be looked for in the present record. Fortunately we find no material dispute on this point, after we get below the mere surface of much that has been said by the witnesses.

The first Gary dinner was held in November, 1907, at a time of unusual financial danger, when the threat of a serious panic was still in the air, and when ruin to many important interests was by no means improbable. The meeting was attended by representatives of from 90 to 95 per cent of the iron and steel trade—including the Corporation and a large majority of its competitors—and the course of the meeting has been described by several of those in attendance. Charles M. Schwab, now president of the Bethlehem Steel Co. (vol. 11, p. 4194) testified:

> The steel trade promised to become in a very demoralized condition. * * * * Prices had gone very low. There was a very scant demand for steel. As I stated before, many people had their warehouses full of steel. When I say there was a demoralized condition, I mean people felt that the market was going to go very low, and they were loaded with stocks. In general, there was a very uneasy feeling throughout the whole situation. * * *
>
> Q. To what class was this situation— to what class, I mean, of persons interested in the steel business,—was this situation particularly threatful?
>
> A. To the people who had stocks; the merchants of steel, the sellers of steel, the retailers.
>
> Q. The middlemen or merchants; the retailers?
>
> A. Exactly, the warehousemen.
>
> Q. Were they especially loaded up at that time?
>
> A. They were.
>
> * * *
>
> (Vol. 11, p. 4195)
>
> A. The keynote of the whole dinner was an address by Judge Gary, or rather a talk to all the members there, with a view of their not becoming panic stricken; with a view of their not sacrificing the situation by too great a cut in prices and not a precipitation of bad business methods; that we ought to retain our heads and not become excited over a situation of that sort, and that we should calmly await the return of prosperity; that our usual prorata of business would probably come to each one regardless of the prices at which it was done; and that it was unwise business policy and bad for the industry and especially bad for the people who carried stocks to precipitate and make worse such a demoralized condition. That was the keynote of everything that was said at that dinner.
>
> Q. Was anything said about entering into an agreement, fixing prices, or output?
>
> A. Nothing whatever.
>
> Q. Were prices mentioned?
>
> A. Not at all.
>
> Q. Was any price of any product mentioned?
>
> A. No; not at all.
>
> Q. I mean, a definite price for a definite product.
>
> A. It was not discussed at all.
>
> Q. Only a general talk along the line mentioned?

A. Just a general talk along the lines indicated.

Q. Was it voted to appoint a general committee or sub-committees at that meeting to study and take care of the situation?

A. I do not know whether those committees were appointed at the first meeting or not, but they were ultimately, I know. Committees were formed of people in the various lines of industry, people familiar with that particular line of industry, to take up in detail the keynote expressed at the first dinner.

Campbell's Version

James A. Campbell, president of the Youngstown Sheet & Tube Co. (vol. 5, p. 1853) says:

"Q. How, Mr. Campbell, will you describe the condition which existed when these meetings about which you have been questioned were begun?

A. Prior to this first Gary dinner, in the fall of 1907, there was a money panic in New York, as they called it. Money was very tight and you could not get currency, and you could not get credit, and the conditions to the business man and to the banker, were very grave at that time. Judge Gary called the leading manufacturers in the steel business together at a dinner, and afterwards that was named the Gary dinner.

Q. Did the alarm as to these conditions exist among others than the manufacturers of steel and iron?

A. Among everybody.

Q. Was it felt by the banking interests throughout the country by the small country banks as well as the big banks in New York City?

A. Yes. We had $1,750,000 on deposit with our bankers in New York and Cleveland and Youngstown at the time and we were obliged to pay our men in clearing house certificates rather than to try and draw that money out of the bank to pay them in currency. We felt that we ought to assist the banks to that extent in securing the currency, as it was almost impossible at that time to make up payrolls and pay in currency.

Q. Then the condition of affairs which existed at that time was a menace not merely to the manufacturers and the banks but to the laboring man as well?

A. To everybody, the laboring men and men in every class of business.

Q. What were the conditions with respect to the jobbers especially with respect to stocks on hand; were they in danger?

A. The jobbers had quite large stocks. It had been a very prosperous year, the largest year up to that time that we had known, and all jobbers and all consumers, as far as we could learn, had very large stocks of material on hand.

Q. And a sudden and great fall in the value of those stocks would have been a great financial harm to those jobbers and consumers?

A. Put about one-half of them, I think, in the hands of receivers and would have carried down banks and business houses generally, besides bankrupting most of the small manufacturers, if they had suffered similar depreciation with reference to their materials.

Q. Were these conditions strong in the minds of you gentlemen when you commenced to meet as you have described?

A. They were. Those were the days when we were lying awake nights. I think everybody was alive to the situation and everybody was alarmed.

Q. Was there a desire on the part of you gentlemen meeting there to sink selfish interests for the general advantage in the situation?

A. There was, yes, but it was a selfish interest after all. If we put our jobbers and consumers out of business, they would not be able to pay us for the material they already had bought from us. We all had large sums of money on our books, and nobody was in a position to pay anything at that time, and we were anxious to protect them, in order to protect ourselves. It was not unselfish entirely, but of course I think we were all broad enough to feel that we wanted to protect the general country for the general good, because it would have been a bad thing for us, as well as anybody else, if we had had a panic that would have carried with it wreck and ruin all along its path.

Q. Was the advantage hoped to be gained that which followed from these meetings, as great or greater to the independents as it was to the subsidiary companies of the United States Steel Corporation?

A. I think it was greater to the independents, because I think it kept a number of them from going into the hands of receivers, and the Corporation would not have failed, even though they had had serious losses.

* * *

Q. Was not the purpose of those meetings to enable everyone present to form his opinion as to what was the best course to follow individually under the conditions which were found to exist, with a full knowledge of those conditions as given by all the other members present?

A. It was."

Gary's Statement

Judge Gary, chairman of the Steel Corporation (vol. 12, pp. 4775 and 4887) testified:

The trouble ordinarily with the purchaser of commodities is that he is obliged to stock up, so to speak, he has on hand large stocks of goods which he has purchased at a certain price, and many times he has purchased those goods by borrowing money at the banks. Now, if a wide and sudden fluctuation comes, the inventory value of his stock on hand is immediately decreased accordingly, and he has a very severe loss, and his bank calls upon him for the payment of his loan and he is unable to do it because he cannot dispose of that stock at a reasonable price, or at a price which will return him the money he had invested. * * * * Just to refer to the panic of 1907, we had repeated letters and repeated calls from people we were selling goods to, who had stocks on hand and who were not in a financial condition to survive if the demoralization which was threatened should become actual, asking us, so far as we could, to try and steady the market in order to prevent demoralization, which would bring great loss upon them, and in many cases absolute ruin.

* * * *

The meeting was held shortly after the beginning of the panic of 1907, after the worst had passed, but while the effect remained to a less extent. We were importuned, or I will say we were requested, in various ways, by various consumers, to do all we could to prevent demoralization in business. Many of our customers reported to us they had large stocks of goods on hand, and if the prices became demoralized as they had in previous years there was great danger of loss to them, and perhaps failure. In those days particularly iron and steel were considered the barometers of trade, so to speak; that is, the market for steel largely affected all other business conditions. In conversation at different times with bankers and others I knew, the question was asked whether or not the steel business was going to pieces, whether we were liable to get into the conditions that had obtained previously. We were all in very great danger of demoralization. I believed if the iron and steel trade got into that condition the panic would be long continued and a great loss and injury would result, not only to the manufacturers of steel but to everyone else who was interested in the manufacture of steel or dependent upon the manufacturers.

I might add that, we had on our books accounts receivable aggregating hundreds of million of dollars, and of course an ordinary old fashioned steel war meant destructive competition, the survival of the fittest, and ruin, or at least the temporary suspension of a great many people, and would result in great loss to us and loss to all other manufacturers, great hardship to our employes, and very serious injury to the business world in general.

I stated the purpose and object of the meeting were if possible to prevent the demoralization of business. I stated that the first object of the meeting was to secure a better acquaintance with each other, and come into close contact in order to know one another, hoping that we might deal with and towards one another as gentlemen and not as enemies; that the purpose was, if possible, to prevent demoralization of business, to secure as far as practicable stability of business conditions as opposed to wide and sudden fluctuations, to prevent if possible failures on the part of our customers and to comply with their wishes in every respect, to prevent, if we could, a long continuance of the panic, which meant failures to a great many people and manufacturers themselves because of their debts at the banks or because of their commitments for extensions and to customers because of the large stocks they had on hand, the sudden change in the prices of which might be very damaging, and so far as we properly could, to maintain or to assist in maintaining business conditions generally, the opposite of which should be deplored. I am giving you the substance of it.

* * *

I stated distinctly * * * at that time that, as they all understood we could not make any agreement, express or implied, directly or indirectly, which bound us to maintain prices or restrict territory or output; it must leave us free to do as we pleased, and must rely upon the disposition of all others to do what they considered fair and right and for the best interests not only of themselves but all others who had any interest in that or any other work. I made that perfectly plain.

The Committees

We think it likely, that if this first meeting had not been followed by others, and by the appointment of committees to continue the association (loose as it was) that resulted from that meeting, no complaints would be heard from the government. But we think the evidence makes it plain that a period of co-operation, or action with a common object, did begin in November, 1907, between the Steel Corporation and the great majority of its independent competitors, and that this period was chiefly marked by an understanding concerning the maintenance of price. Other matters were discussed at the various meetings, but the principal concern was the subject of prices, and other subjects were subordinate. Without quoting too freely from the testimony, we think the following extracts are typical. A representative of the Carnegie company testified:

Q. You were asked about whether you had any agreement and you said no. What did you mean by agreement, in the sense that you answered that question?

A. I meant a formal undertaking, either written or expressed by word.

Q. What do you mean by a formal undertaking?

A. I mean by a formal undertaking an expression in a formal way.

Q. In what way? I would like you to explain that.

A. Either in writing or by word of mouth.

Q. What kind of an expression in a formal way? Do you mean something of the nature of a contract?

A. I presume you mean by passing a promise?

Q. No, I am not saying what I mean, but I am trying to get at what you mean.

A. What I mean is this: That there was *no absolute promise* made by anybody.

Q. That is what you meant when you said that there was no agreement.

A. Yes.

Q. I will ask you whether or not you left with the general understanding, each relying upon the other, that the prices announced would be maintained.

A. Yes, sir. Yes, sir.

Q. And what would interrupt the maintenance of that price, according to that understanding that you left with?

A. Usually one competitor would take some business away from another competitor.

Q. As I understand you say that would be the occasion of another meeting.

A. Yes, sir.

* * *

By Mr. Lindabury:

Q. I will read from the bill in this case.

"It is not here alleged that merely assembling and mutually exchanging information and declaration of purpose amounts to an agreement or combination in restraint of trade."

I will mark that so you can read it, and hand it to you (handing witness the paper referred to).

My question—as you may pause to consider it if you choose—is whether or not, at any of these meetings you attended, beginning in the autumn of 1907, anything more was done than is there stated.

A. No, sir.

By Mr. Dickinson:

Q. You said that you assembled?

A. Yes, sir.

Q. You exchanged information?

A. Yes, sir.

Q. And you declared purposes as to prices?

A. Yes, sir.

Q. I understood you to say also, that you left, each relying upon the other that that price would be observed by them, and that the announcement of that price was made to the trade?

A. Yes, sir. (vol. 6, 2505-09).

A representative of the McKeesport Tin Plate Co. testified:

Q. Was there not what you understand as a gentlemen's agreement as to following the price that was named, until the next meeting?

A. There would be a general understanding that we would do what we would say we would do—quote a certain figure until, as I say, we found reason to change it; and if we found reason to change it we would notify our competitors, or talk with them about it, when another meeting would be held and conditions discussed.

Q. Another meeting would be held?

A. Yes. * * *

Q. Would or not a price be suggested?

A. A price would always be suggested.

Q. State whether or not, before they left, there was any difference as to what each one said he was going to charge, or whether it would be the same.

A. It was always unanimously agreed, or the statement was unanimous on the part of all that they would quote a certain price. (vol. 5, p. 1777).

Q. What would you do, if anything, in regard to the future prices?

A. Then we would say. "Well, we will quote a certain price, until we find reason to change it."

Q. Then you would leave with the same understanding, that each was going to sell at that price?

A. Yes, sir.

Q. State whether or not any one made any remark at any such meetings that if they cut the price it would be found out.

A. I think we discussed that among ourselves in general. I might say that if any one quoted a lower price to a particular customer than we did, that I would find it out. (vol. 5, p. 1778).

* * *

"Q. Was it or not a part of your understanding, after these prices were announced, that you were under a moral obligation to sell at that price until you did notify your competitors?

A. Yes, sir. (vol 5, p. 1792-93.)"

Now to our minds the testimony taken as a whole makes the conclusion inevitable that the result of these meetings was an understanding about prices that was equivalent to an agreement. We have no doubt that among those present some silently dissented and went away intending to do what they pleased, but many, probably most, of the participants understood, and assented to the view, that they were under some kind of an obligation to adhere to the prices that had been announced or declared as the general sense of the meeting. Certainly there was no positive and expressed obligation; no formal words of contract were used; but most of those that took part in these meetings went away, knowing that prices had been named and feeling bound to maintain them until they saw good reason to do otherwise, and feeling bound to maintain them even then until they had signified to their associates their intention to make a change. We cannot doubt that such an arrangement, or understanding, or moral obligation —whatever name may be the most appropriate—amounts to a combination or common action forbidden by law. The final test we think is the object and the effect of the arrangement, and both the object and the effect were to maintain prices, at least to a considerable degree.

We have said that this was the effect intended, and we believe it to be true also that in actual effect prices were more or less maintained. But it is quite as true that a large section of the trade paid little attention, if any, to this effort at co-operation. We need not quote again from the record to establish this point, for we have already made sufficient extracts earlier in this opinion. The testimony quoted will make it abundantly clear we think that even during the period of co-operation the prices announced and informally assented to at these meetings were not regarded at all by many manufacturers, for it is plain that the consumers who testified had no difficulty in buying at rates sensibly below the prices thus referred to. It is only

Dissolution Would Have Been a Public Calamity

By Isaac N. Frank, President United Engineering & Foundry Co., Pittsburgh.

IN THE first place, we believe that the decision is entirely fair and just and in keeping with the high ethical business methods of the United States Steel Corporation. We believe that no influence has been so great as the high moral principles on which it conducts its business. It has raised the plane of business integrity and ethics as we believe no other influence has. We believe that a dissolution of that company would have been a national calamity, and congratulate the nation, as well as the Corporation, on the decision of the appellate court of the United States, and we hope if the case is appealed to the supreme court of the United States that it, in its wisdom, will confirm all the findings of the lower court.

Second, we believe that the effect of this decision will be most beneficial to business—that many enterprises that have been held in abeyance, both by the Corporation and by other large business interests, will now go forward with a confidence that has been shaken for the past five years.

Altogether we believe that the decision is of the greatest benefit to the nation and its business interests.

fair to add that in our opinion the participants in this movement did not intend to act illegally. No doubt they did intend to exercise their full legal rights, but of course such exercise could not be wrong, and they believed they had succeeded in keeping within the proper limits. For the reasons given, we think they were mistaken, but we acquit them of trickiness or attempted evasion.

Repetition Not Likely

But the period of co-operation had passed away before the bill was filed, and as far as we can see, it is not likely to be repeated. We do not think the Gary movement would justify us in imposing so drastic a penalty as the dissolution of the Corporation, but we will, if the government moves for such action, retain the bill for the purpose of restraining any similar movement by the defendents that might be contemplated hereafter. We may perhaps suggest that under recent legislation congress may have provided a sufficiently inclusive remedy for any future action that might have for its object the adoption or the maintenance of unreasonable prices.

In brief, the conclusions of the court are these. As to some of the defendants it is apparent the bill should be dismissed. Concerning the principal relief sought against the Corporation and its subsidiaries, we are of opinion that the government has not made out a case that should be followed by a decree of dissolution, and we are also of opinion that sufficient reasons have not been afforded to justify us in now awarding an injunction. But, as already stated, if the government so desires, the court will retain jurisdiction of the cause for the purposes above outlined.

Thanks to Counsel

In concluding this opinion, we are requested by each of the members of this court to express the thanks of this court to all the counsel engaged in the cause and record our appreciation of the labor on their part evidenced in their several briefs, digests, cross-references, indices, etc. It is but just to say that the thorough preliminary work on the part of counsel has greatly aided our labors and has enabled us within the limits of reasonable time and without delaying our routine work to reach a reasonably prompt determination of this cause.

A decree may be prepared in accordance herewith.

Views of Judges Woolley and Hunt

The concurring opinion of Judge Woolley, in full, follows:

Woolley, circuit judge, with whom Hunt, circuit judge, concurs.

In an endeavor to state with brevity the matters of law and fact which have directed and controlled my judgment in this case, no attempt will be made to review the great mass of testimony or to discuss the law bearing upon it.

Whether the Steel Corporation is a combination in restraint of trade or has monopolized or has attempted to monopolize commerce among the states in violation of the anti-trust law, depends upon the inherent nature or effect of the combination, the evident purpose of its acts, or the intent to be inferred from the extent of the control secured over the industry, the method by which such control has been brought about and the manner in which it has been exerted, resulting in prejudice to the public interests by unduly restricting competition or unduly obstructing the course of trade. United States vs. Terminal R. R. Assn., 224 U. S. 383, 394; Nash vs. United States, 229 U. S. 373; the Standard Oil Co. vs. United States, 221 U. S. 1; United States vs. American Tobacco Co., 221 U. S. 106, 179.

There is no question that the Steel Corporation is a combination. The question is, whether it is a "combination * * * in restraint of trade", and whether the Corporation, its subsidiaries and the individual defendants who actively engaged in its organization, monopolized or attempted to monopolize, or combined with others to monoplize or restrain trade within the meaning of the act. Inquiry to this end may be pursued along four lines.

Direct Effect

First:—Was the direct and necessary effect of the organization of the Corporation to unduly restrain trade or create a monopoly?

The important business units which at or about the time of its organization comprised the United States Steel Corporation (which in default of a better term will be called the "constituent combinations"), were the Carnegie Steel Co., Federal Steel Co., National Tube Co., American Bridge Co., National Steel Co., American Steel Hoop Co., American Sheet Steel Co., American Tin Plate Co. and American Steel & Wire Co. Each of these units was in itself a combination of concerns engaged in the manufacture of the same or allied products. The effect of the organization of these combinations was to suppress competition between their component parts, and the effect of the organization of the Steel Corporation, by embracing these combinations, was to give it a control over the industry equal in the aggregate at least to that which its constituent parts and their subsidiaries had theretofore possessed. The Steel Corporation, therefore, is a combination of combinations, by which, directly or indirectly, approximately 180 independent concerns were brought under one business control, thereby giving it not only the assets and business of that number of producers, but the advantage of their elimination from the field of competition. It is, therefore, pertinent to ascertain whether the amount of competition suppressed by the combination of producing units was so great, the percentage of business acquired so large, or the resultant control over the industry so potential, as in and of itself to constitute the Steel Corporation a monopoly, independent of any question of intent.

The inherent power or the direct and necessary effect of the Corporation to unduly restrain trade, must be gathered from what it did with the power it had during the period between the date of its organization and the date of the institution of this suit, and what it was unable to do with that power.

What the Corporation did constitutes conduct, a subject which will presently be considered, and what the Corporation did not do is so related to conduct that the two will be considered together. What the Corporation had the power or did not have the power to do must first be determined.

What Was Its Power?

The power of the Corporation may be ascertained by its position in the industry. Its position has doubtless been attained by a combination of forces, which may include high efficiency of plants, excellence of organization, capacity of employes, and its measure of control over raw materials and the production of finished products. As there can be no monopoly of efficiency and capacity, inquiry concerning the power of the Corporation, therefore, leads mainly to its dominion over the raw materials and finished products of the industry.

The ore reserves acquired by the Corporation at and subsequent to its organization, the relation which such reserves bear to ore bodies then existing and subsequently discovered, and their bearing upon the question of monopoly of raw materials, are matters which have been discussed in the preceding opinion, and with the reasoning as well as with the conclusion that the Corporation has not a monopoly of the raw materials of the steel industry, I am in entire accord.

A more extended consideration of the power of the Corporation, derived from its ore reserves, is unnecessary, further than to dispose of a transaction connected with the acquisition of certain ore properties.

Prior to the organization of the Steel Corporation, John D. Rockefeller became interested in a number of ore properties in the Mesabi range, in Minnesota, and in properties primarily intended for the transportation of ores to the market. These properties were the Lake Superior Consolidated Iron Mines, which owned a considerable group of iron ore properties in that region; a railway company running from Mesabi range to Duluth, called the Duluth, Missabe & Northern Railroad Co.; and a steamship company owning a group of steamers plying the Great Lakes, called the Bessemer

Steamship Co. The mining company owned the railway company. John D. Rockefeller owned 25/29ths of the stock of the mining company. He owned all the stock of the steamship company.

After its formation, the Steel Corporation contracted with John D. Rockefeller for the purchase of his interest and the interest of the other stockholders in the Lake Superior Consolidated Iron Mines and the Bessemer Steamship Co., and paid for the latter $8,500,000 in cash, and for the former, stock of the Steel Corporation at the rate of 1-35/100 shares of preferred and 1-35/100 shares of common for each share of the Consolidated Iron Mines, reckoned on a capitalization of $48,000,000, the current market price for the steel shares being respectively 83 and 38.

John D. Rockefeller and his son, John D. Rockefeller Jr., were made directors of the Steel Corporation. The former resigned in 1904 and the latter in 1910. John D. Rockefeller disposed of all of his stock, and John D. Rockefeller Jr., disposed of a considerable portion of his stock in the Steel Corporation, acquired by the afore-recited transaction, prior to the filing of the bill in this case.

The bill charges the acquisition of the Consolidated Iron Mines and the Bessemer Steamship Co. subsequent to the organization of the Corporation. It also charges generally, that the individual defendants named in the bill, by the subsequent acquisition and control of properties, entered into a combination with the Corporation in restraint of trade, but in this connection the defendants Rockefeller are not named. The sole specific statement of fact in the bill with respect to the defendants Rockefeller, relates to the sale to the Corporation of stock of the Consolidated Iron Mines and the Bessemer Steamship Co., and the sole specific charge is that these defendants were largely interested in those properties, and that "both of them participated in bringing about the combination and became members of the first board of directors of the Corporation".

By the prayer of the bill, the properties acquired from the defendants Rockefeller are not asked to be returned to them, or that the sale be avoided, but that the ore properties of the Corporation, which of course include those acquired from the defendants Rockefeller, be divided among certain corporations contemplated by a decree of dissolution in proportion to their capacity for the production of steel.

There is no evidence or assertion that the purchase of the Consolidated Iron Mines and the Bessemer Steamship Co., and incidentally the Duluth, Missabe & Northern Railroad Co., was included in the original scheme for the organization of the Steel Corporation, nor is there evidence which shows that the defendants Rockefeller took part in the promotion or organization of the Corporation. By stipulation with the government, it is in evidence that at the time the bill was filed, the defendants Rockefeller had no relation of management or control to the Steel Corporation, and there is nothing to show that they were then or are now violating or threatening to violate the statute.

We find that the transaction of the sale of the Lake Superior Consolidated Iron Mines and the Bessemer Steamship Co. was no part of the original plan for the formation of the Steel Corporation, that the transaction was not only in form, but was in substance a sale, and that the single fact that the purchase price of one of the properties was paid with the stock of the Corporation, does not alter the legal character of the transaction as a sale or prove that it was violative of the statute. We also find that the purchase of these properties from the defendants Rockefeller did not so increase the ore reserves and the transportation facilities of the Corporation as to give it a monopolistic power over the raw materials of the industry. For the reasons given, we are unanimously of opinion that the bill should be dismissed as to the defendants Rockefeller.

Corporation's Limitations

Further inquiring whether the Corporation inherently possesses monopolistic power, attention is next given to the proportion of the manufacture and sale of finished iron and steel products of the industry. Upon this subject there is a great volume of testimony, a detailed consideration of which in an opinion would be quite inexcusable. As a last analysis of this testimony, it is sufficient to say it shows, that large as was the Corporation and substantial as was its proportion of the business of the industry, the Corporation was not able in the first ten years of its history to maintain its position in the increase of trade. During that period, its proportion of the domestic business decreased from 50.1 to 40.9 per cent, and its increase of business during that period was but 40.6 per cent of its original volume. Its increase of business, measured by percentage, was exceeded by eight of its competitors, whose increase of business, likewise measured by percentage, ranged from 63 to 3,779. This disparity in the increase of production indicates that the power of the Corporation is not commensurate with its size, and that the size and the consequent power of the Corporation are not sufficient to retard prosperous growth of efficient competitors.

From the vast amount of testimony, it is conclusively shown that the Steel Corporation did not attempt to exert a power, if such it possessed, to oppress and destroy its competitors, and it is likewise disclosed by the history of the industry subsequent to the organization of the Corporation, that if it had made such an attempt it would have failed. It is also shown by the testimony, that, acting independently and relying alone upon its power and wealth, great as they were, the Corporation has never been able to dominate the steel industry by controlling the supply of raw materials, restraining production of finished products, or enhancing and maintaining the prices of either.

Main Point of Inquiry

If in its early history, the Steel Corporation, singly and alone, endeavored to dominate the steel industry in any one or several of the customary ways, (and such is not disclosed by the testimony) it ceased early to rely upon its own power. In fact, its lack of power to dominate the industry alone, is established by the methods it was forced to institute and pursue with respect to the important matter of the fixation of prices, the legality of which, in my opinion, becomes the main point of inquiry in the case. Instead of relying upon its own power to fix and maintain prices, the Corporation, at its very beginning, sought and obtained the assistance of others. It combined its power with the power of competing corporations, and then with its competitors concerted, co-operated, contracted and then by tacit understandings contributed to the establishment and maintenance of prices. The co-operation by the Steel Corporation with its competitors to fix and maintain prices neither sprang from its inherent nature nor was it the direct and necessary effect of its organization. It constituted conduct, and conduct of the same character as that pursued by the Corporation's competitors participating therein. The testimony does not show that the Corporation in and of itself ever possessed or exerted sufficient power when acting alone to control prices of the products of the industry. The testimony abundantly shows that the power of the Corporation to control prices was efficient only when in co-operation with its competitors. It has never raised and maintained prices by its own action. It has done it only by joint action, and when joint action was either refused or withdrawn, the Corporation's prices were controlled by competition. To the conduct of the Corporation in fixing and maintaining prices by methods it with others employed, the charge of violation of the statute is most pertinently addressed.

Not Inherent Monopoly

Distinguishing the power of the Corporation from its conduct subsequent to its organization, I am of opinion, for the reasons here given, that in its inherent nature, the Steel Corporation is not a monopoly, and that the direct and necessary effect of the organization of the Corporation was not unduly to restrain trade.

Second:—Was an intent to monopolize or to unduly restrain trade shown by the circumstances which led up to and surrounded the organization of the Corporation?

For several years preceding the organization of the Corporation in 1901, the steel industry was undergoing a revolution in business methods. Combinations of manufacturers producing the same as well as diversified products, were formed upon tremendous scales, embracing in many instances a majority, and in some instances nearly all, the producers of a particular product. This industrial revolution and the combinations which grew out of it, have been explained upon two theories.

The first theory is based, as it is contended, upon the discovery made at or about that time, that the economic manufacture of a finished steel product required the ownership of the raw material and the manufacture of the unfinished product by the same

corporation, and the manufacture of the unfinished product required facilities for finishing the same in order to secure a regular and certain output. In other words, a necessity for integration developed, that is, the manufacture of steel products on a large scale, beginning with the ore and concluding with the finished product, to accomplish which aggregations of mills that produced different commodities were essential. That this was in the minds of the steel masters of that day is without question, and it is now contended by the defendants, that to attain this was the object of the formation of the Steel Corporation.

Theory of Price Control

The other theory advanced in explanation of the tremendous and rapid combination of steel producing plants at that period, in which less regard was paid to combining plants producing diversified products than to combining plants producing the same products, is, that by such combinations, competition in trade could be suppressed to an extent commensurate with the amount of trade combined, and that by the resultant control, prices could be raised and maintained that would yield great profits.

Much testimony has been produced in this case by the opposing parties in support of and in opposition to these opposing theories, a review of which within the limits of an opinion is quite impossible to be made. Evidence of the acts and things done at the time they were done, the character of the combinations made and the results then and subsequently attained, as disclosed by testimony which corresponds in point of time with the doing of the things, carry to my mind a greater probative force in determining the reason for the combinations and the purpose of the organization of the Steel Corporation than explanations thereof made at after periods. There is much testimony given by witnesses, looking back over the history of the Corporation and its constituent combinations, to the effect that the purpose of the organization of the constituent combinations and then of the larger combination, the Steel Corporation, was to assemble huge properties so as to procure perfect integration. Yet the testimony which impresses me most is that which relates to and concerns the things said and done preliminary to and connected with the organization of these various combinations at the time of their creation. These circumstances indicate that the various combinations were made upon a scale that was huge and in a manner that was wild. Properties were assembled and combined with less regard to their importance as integral parts of an integrated whole than to the advantages expected from the elimination of the competition which theretofore existed between them.

Without referring to the great mass of figures which bears upon this aspect of the case, it is clear to me that combinations were created by acquiring competing producing concerns, at figures not based upon their physical or their business values, as independent and separate producers, but upon their values in combination, that is, upon their values as manufacturing plants and business concerns with competition eliminated. In many instances, capital stock was issued for amounts vastly in excess of the values of the properties purchased, thereby capitalizing the anticipated fruits of combination. The control acquired over the branches of the industry to which the combinations particularly related, measured by the amount of production, extended in some instances from 80 to 95 per cent of the entire output of the country, resulting in the immediate increase of prices in some cases double and in others treble what they were before, yielding large dividends upon greatly inflated capital!*

Eliminating Competition

The immediate as well as the normal effect of such combinations, was in all instances a complete elimination of competition between the concerns absorbed, and a corresponding restraint of trade. That for a time during that period, monopoly was created and trade unduly restrained in certain steel products by the combinations which almost exclusively produced them, is seriously charged and not satisfactorily denied. Such was the common knowledge of those conversant with the steel industry, and as many of the men who participated in the organization of such combinations participated actively in the organization of the Steel Corporation, it is difficult to believe that they did not know that to some extent, and probably to what extent, such combinations restricted and suppressed competition, and that they did not expect, by force of the multiplied absorption of trade and by the power resulting from the increased elimination of competition, the Steel Corporation would be enabled to fix and regulate the production and prices of all commodities in the industry. Such would seem to be a natural thing to expect of a combination of competing corporations which in themselves were combinations of competing corporations, and it is but fair to charge that those who created such a combination of combinations intended what in the nature of the situation would be thought to be its natural and probable consequence.

It was insistently urged by the Corporation, both in the briefs and at the argument of this case, that in the conversations between Mr. Schwab and Mr. Morgan preliminary to and during the negotiations for the combinations which were afterwards acquired by the Steel Corporation, no word passed between them concerning increased profits, hoped for or expected to be derived from the elimination of competition, and that their discussions were addressed and limited to economies of manufacture and business. It is worthy of comment in this connection, that, in so far as those conversations are repeated in the testimony, the word "integration" was not mentioned, and excepting by inference, the idea of integration was not suggested by the one who gave or by the one who responded to the inspiration to create such a combination as the Steel Corporation. The purpose of its organization, in so far as it was expressed by either of those gentlemen, as disclosed by the testimony, was to acquire a number of mills in each of which to manufacture but one thing instead of many things, and to procure enough mills to make and manufacture every product in the steel industry, with the hope of acquiring the foreign trade. The precise reasons for the formation of such a combination, and the particular advantages to be expected therefrom, as stated by Mr. Schwab to Mr. Morgan in the conversations which are represented to contain the ideas which suggested and which justified the formation of the Steel Corporation, are:

> that instead, as was then the practice, of having one mill to make 10 or 20 or 50 products, the greatest economy would result from having one mill make one product, and make that product continuously. * * * * that various lines of steel should be so specialized. * * * * that great economies would result from locating mills at the point of consumption, by which the cost of transportation * * * * would be reduced or saved. * * * * that great economic results would follow from being able to manage these concerns in a manner that would stimulate the most effective effort in the management of the different concerns. * * * * that the great export business of this country in iron and steel could only be done in that way. * * * * (the companies to be acquired were) such as to cover all the branches of the industry. * * * * (and that) successful manufacture was only possible where every single step in the line of manufacture was carried out by some one concern; and that for the greatest economy, for the greatest development of the business, it was an absolute necessity.

Mr. Schwab's Statement

Continuing, Mr. Schwab said:

> I felt, furthermore, that great economies would result in all these general items of

*The organization of the constituent combinations, their over-capitalization and the increase in the prices of their products, are matters so complex in their recital and embrace such a considerable portion of a record altogether unprecedented in size, that nothing more than a single instance can be briefly stated in a foot note.

The National Tube Co. was incorporated in February, 1899. It was a combination of manufacturers representing from 80 to 90 per cent of the production of iron and steel wrought tubes in the United States. (V, 1891, 1913; G. E., V, pt. II, 1785-1788, 1794) An expert valuation of the properties acquired, exclusive of the Western Tube Co., was the sum of $22,303,500. (V, 1867-72) For the properties and plants, so valued at $22,303,500, personal assets estimated at $10,000,000, and $2,500,000 cash furnished by the promoters, making a total of $34,803,500, plus the value of a part interest in the Western Tube Co., the National Tube Co. issued to the consolidation purchasers over $79,000,000 in stock. (G. E. II, 381-84, 392-94) Of the approximate amount of $40,000,000 of preferred and $40,000,000 of common, issued to the consolidation purchasers for the properties acquired by it, (G. E. II, 372-94) it appears that the common stock received by the consolidation purchasers to the amount of about $40,000,000 was to be distributed approximately as follows: To the vendors of the properties acquired, between $3,000,000 and $11,000,000 in excess of the cash valuation of their properties; to the syndicate in excess of the amount of cash furnished by it $5,000,000; to Morgan & Co. $3,500,000; and to the consolidation purchasers and Morgan & Co. for promotion, between $20,000,000 and $28,000,000. The net earnings of the National Tube Co. for its first six months were $7,909,060, a rate of 19 per cent, per annum on the capitalization of $80,000,000; and the net earnings for the first fiscal year, after deducting expenses, depreciation and reserve, were $13,878,364.69, which is something over 17 per cent on its total capitalization. Before the formation of the National Tube Co., the price of tubes was $30 a ton. During 1899, the year of its formation, the price of tubes rose to $67 a ton, and in the early part of 1900, reached their maximum of $89 a ton. (XXVII, II, 390-1, 11426-7, 11433).

expense which are met in the manufacture of iron and steel, on account of selling, traveling, office expenses, and all the general items of each individual concern which an individual line had to cover with a full organization. That could be covered by one such organization, and I felt that such economy would result in that direction, and indeed the whole line of my talk that evening was intended to show that the next great economic step to be made in the manufacture of steel—or indeed any business in general—I did not confine myself entirely to the steel business—directly to the steel business, but in general that the great economic result to be next obtained in manufacture was in the direction of these methods, and then I made that application generally to the steel industry.

Mr. Schwab then pointed out to Mr. Morgan the plants, which if acquired, "could be made ultimately to conform to this theory". It does not appear in the testimony just what plants Mr. Schwab suggested should be acquired, nor does it appear that Mr. Morgan acquired or attempted to acquire any plants of any independent producers of that day. It does appear, however, that Mr. Morgan proceeded immediately to acquire, not plants, but the huge combinations themselves, which had but recently been formed and which had but recently demonstrated their ability to suppress competition.

The objects of the formation of the Corporation, as stated by Mr. Schwab, were those avowed at the time of its organization, and the things done to accomplish those objects must be accepted to have been done in the light of the situation as it then existed.

Primary Purpose

The declarations of Mr. Schwab with respect to the objects of the organization, and the conduct of Mr. Morgan and his associates in creating the Corporation by combining the most powerful combinations which then existed, the conspicuous features of which were over-capitalization and the elimination of competition, constitute evidence which must be considered in seeking the purposes for which the Corporation was organized. That evidence, as against the testimony to the contrary, impels me to the opinion that the primary purpose of the organization of the Steel Corporation was not integration. Integration was a result of the organization, and afterward became a necessity. When integration was undertaken it was but imperfectly accomplished by employing the units acquired. It was only perfected by building new mills at a cost of over $400,000,000. After a consideration of the character and conduct of the combinations absorbed by the Corporation, and of the complete knowledge of the industry possessed by those who brought the Corporation into existence, I am irresistibly drawn to the conclusion that the object of the formation of a corporation which embraced such combinations, and the intent of those who undertook its accomplishment, were to secure great profits by restraining trade in the manner and upon the scale thought possible in the light of the history of the constituent combinations.

Strongest at Birth

The constituent combinations absorbed by the Corporation were strongest at their birth. Their percentage of output and their corresponding control over their particular branches of the industry were greatest when organized, but diminished year by year in combat with competitors who entered the field against them, supplied with ample resources, equipped with modern plants and unencumbered with obsolete or dismantled properties. As an illustration, the American Tin Plate Co., incorporated in December, 1898, was a consolidation of 39 plants with 279 mills engaged in the manufacture of tin plate. It is charged and not denied that at the time of its formation, this combination comprised 90 per cent of the tin plate manufacturers of the country, which controlled 95 per cent of the total output of tin plate in the United States. The result was an immediate rise in the price of its product and a decrease in the number of its producing units. As a consequence of its policy, 86 mills of 19 plants, that is, about one-third of the mills acquired, were promptly dismantled. Notwithstanding this initial and potential control over the product and prices of the tin plate industry, it nevertheless happened, that while in 1899 the American Tin Plate Co. produced 95 per cent of all the tin plate manufactured in the United States, its control from that year gradually decreased until in 1912 its proportion of the manufactured output was but 53.7 per cent. After it was absorbed by the Corporation, it ceased to rely upon its own power to fix and maintain prices, complete as was its power at first, and like the other subsidiaries, was forced to co-operate with its competitors.

The experience of the American Tin Plate Co. is illustrative of the history of various combinations absorbed by the Steel Corporation. It is likewise the explanation of the seeming anomaly that the Corporation at the time of its organization, in and of itself possessed less power as a monopoly than certain of its constituent units possessed at the dates upon which they were respectively created. The absorption by the Steel Corporation of combinations which in themselves possessed monopolistic powers, potential in their beginning though waning as they progressed, irresistibly draws me to the conclusion that those who organized the Steel Corporation expected to accomplish permanently what had been demonstrated could be accomplished temporarily, and thereby to monopolize and unduly restrain trade. But when organized, the Corporation discovered that it was confronted by forces beyond its control, that it was affected by trade laws and conditions which in its organization were either forgotten or ignored, and that therefore it was without the power alone to do what its organizers expected of it, and was immediately forced to resort to the old device of pools in order to control and maintain the prices of its products. I am of opinion that the circumstances which led up to and surrounded the organization of the Steel Corporation, show that those who organized the Steel Corporation intended it to monopolize and unduly restrain trade.

The After Conduct

Third:—Was intent to monopolize or to restrain trade shown by the after-conduct of the Corporation?

There are a number of customary tests by which the existence of trade restraint may be ascertained and the extent thereof may be gaged. In applying these tests to the after-conduct of the Corporation, the testimony responds, in my opinion, by disclosing but one line of the Corporation's conduct violative of the statute.

There is nothing in the evidence that suggests that the Corporation used its power to gain advantage over its competitors by securing freight rebates. On the contrary, it appears that early in its history the Corporation announced a policy and promulgated a rule against soliciting and accepting rebates.

There is nothing to show that the Corporation increased its profits by reducing the wages of its employes. The increased volume and reward, as well as the improved conditions, of labor, for which the Corporation, at considerable length, takes credit to itself, have no bearing upon the issue of monopoly except as they tend to prove that monopoly was neither attempted nor acquired at the expense of labor.

There is nothing in the evidence that suggests the Corporation increased its profits by lowering the quality of its products. The testimony that the quality of the Corporation's products has not deteriorated but has improved, is pertinent to the inquiry whether monopoly was attempted or accomplished at the expense of the quality of its products, but the considerable volume of testimony as to the high quality of its products and the excellence of its service, has no probative bearing upon the issue of monopoly. The question is not, whether the Corporation is a serviceable monopoly. The question is, whether the Corporation is a monopoly.

There is nothing which discloses that the Corporation either increased its power or augmented its profits by creating an artificial scarcity of its products.

The testimony does not show that the Corporation oppressed or coerced its competitors. In fact, there is an abundance of testimony contributed by the competitors of the Corporation, to the effect that its competition, though vigorous, was fair.

Selling Policy

The Corporation did not under-sell its competitors in particular localities by reducing prices below the prices at which it sold in other localities, nor did it require its customers to enter into contracts either limiting their purchases to the Corporation or restricting them in re-sale prices. While purchasing pig iron at prices higher than the market, in order by reflection to maintain or increase the price of steel, purchases were not made by the Corporation beyond its needs nor with the intent or result of cornering the market. It did not obtain customers of competitors by secret rebates, or departures from its published prices, so long as the prices agreed to were adhered to by others pursuant to methods presently to be considered. There is no evidence that it attempted to crush its competitors or drive them

out of the market, and in its competition, it seemed to make no distinction between large and small competitors. In fact, its conduct towards its competitors, as shown by the testimony, has been conspicuously free from that business brutality, meanness and unfairness which characterized the conduct of certain large corporations found guilty of violating the anti-trust law.

The charge that the Corporation offered lower prices in return for large purchases running over long periods, if true, does not constitute unfair trading. In those instances the Corporation endeavored and succeeded in obtaining contracts for large purchases of unfinished or semi-finished materials so as to secure a steady trade for a long period and thereby secure steady and certain employment for its mills.

The Corporation's reply to the charge of undue restraint of trade by combining with others to fix and maintain prices, and the assumption to itself of credit for the benefits arising from its conduct" in *steadying* the market and preventing rapid and extreme fluctuations", is somewhat of an admission that it (with others) controlled prices by artificial means. I know of no law which makes the *steadying of the market* a justification for fixing and maintaining prices by the concerted action of otherwise competing companies, when the effect of steadying the market is to dominate the industry by establishing prices for its products. The perfection of stabilizing prices can be reached only when monopoly is perfect, and as nothing justifies monopoly, I am of opinion that the stabilizing benefits claimed by the defendants in fixing and maintaining prices are no justification or excuse for what they did. Prices are perfectly stabilized by pools when entered into and lived up to, yet no one would contend that a pool, however beneficent its results, is either justifiable or legal. If the establishment of uniform prices for the products of an industry should ever be found advantageous or necessary, such an economic policy should be inaugurated and pursued under authority of law, and not by the will of the industry itself.

Real Competition

Competition with the Corporation in all of its products has been real and keen from the date of its organization to the date of the filing of the bill in this suit. About this there is no question, with the possible exception of seamless tubes, which were made under important patents acquired or controlled by the Corporation. Every commodity which it made was sold in substantial competition. This is conclusively proved. It is not proved, however, that the competition which existed between the Corporation and its competitors extended to prices. While during that period, competition was real, it was pursued along levels and at figures agreed upon expressly or tacitly, by pools, or at meetings and dinners. At different times when price undertakings and understandings between the Corporation and its competitors were broken, notably in 1909, the feature of prices entered into the competition, and then competition was complete and without restraint. Otherwise and at other times, competition was real, but it was restrained as to prices. Therefore, in searching the after-conduct of the Corporation for evidence of an intent on its part to monopolize and restrain trade, the participation of the Corporation in the old and the new means pursued and devised, by which prices were raised and maintained, demands serious consideration.

Pool Agreements

Before and at the time of the organization of the Corporation and for several years thereafter, a very great many of the companies that became its constituents and subsidiaries were allotting trade and fixing prices for different iron and steel products by pool agreements. It is not necessary in this opinion to discuss the legality of such agreements. It is sufficient to state that it was known by all they were denounced by the law. With this knowledge, the Corporation, through its president, in 1904, commended its subsidiaries to withdraw from pools, yet notwithstanding the policy then announced, certain of its subsidiaries, notably the American Steel & Wire Co., continued in pools formed as late as 1908. It is defended, however, that the participation of the American Steel & Wire Co. in the pool last mentioned was without the sanction of the Corporation and without the knowledge of its president. It is really unimportant to give consideration to the Corporation's claim of exoneration upon this ground, in view of the fact that the Corporation itself, with the concurrence of its president, at the very same time, at periodical meetings with its competitors, was fixing prices covering a wide range of commodities, not by agreements, but by understandings by which all were morally bound and from which no one deviated without notice to the others. By these methods the Corporation and its subsidiary, the American Steel & Wire Co., were contemporaneously and quite as effectually naming and maintaining prices in different products. Measured by the successful results of each, there can be little difference between the methods employed.

When pools and associations were very generally abandoned in 1904, they were succeeded by trade meetings attended by representatives of the same concerns which theretofore had been parties to the pools. At these meetings, agreements respecting prices were not made, but understandings were reached with respect to prices which quite as effectually resulted in their maintenance. The legality of these meetings was questioned, and about the year 1907 they were abandoned, and in the same year the Gary dinners were inaugurated.

The Other Plan

The Gary dinners were dinners given by E. H. Gary, the president of the Corporation, to which were invited representatives of steel manufacturing concerns which theretofore had participated in the trade meetings, associations and pools, and which produced "90 per cent or more" of the total output of the diversified products of the steel industry of the country.

The first Gary dinner was given on Nov. 20, 1907, to meet an unquestioned exigency arising out of the panic then existing. The steel industry, like many industries, was demoralized and threatened with disaster by the panic which began in the month preceding. The dinner was given in order to devise ways and means to prevent calamity to the industry. Ways and means were found which no doubt contributed greatly in preventing disaster not alone to the producers of steel, but also to those intermediate consumers who were carrying large and costly supplies. The ways and means consisted then of nothing more than the urgent request of a strong man, that in the stress of panic all should keep their heads and avoid the consequences of reckless cutting of prices. In this the others acquiesced, and in the light of the emergency then existing and the disaster averted, I am of opinion that the purpose and the conduct of those who participated in the first Gary dinner were not unlawful, improper or questionable. But after the exigency had passed and the means to meet it had been exerted, Gary dinners were found to be potential things, and they were afterwards called and employed to exert their potentiality not in averting disaster, but in creating greater profits by raising and maintaining prices in periods of industrial calm.

Continuous Dinners

Gary dinners, while not regularly held, never adjourned. They were made continuous by the peculiar character of their organization. Being nothing more than business meetings, they were conducted in a business fashion. A general supervisory committee was appointed to deal with the different products of the steel industry. These latter committees were known as the steel bar committee, ore and pig iron committee, rails and billets committee, etc. The membership of each committee was composed of representatives of the leading concerns which manufactured the particular product with which the committee had to do. These committees met between dinners, and were accessible, through their chairman, at all times between meetings. The only difference between the Gary dinners and the meetings of the committees was that at the dinners the general business of the industry was discussed, while at committee meetings the business of a particular branch of the trade was discussed. At neither were agreements made concerning prices at which the participants would sell their products. In fact, it was asserted and re-asserted that such agreements were impossible because illegal, but in lieu of agreements, the parties, both at the dinners and at the committee meetings, severally made what they chose to call "declarations of purpose", that is, declarations of the prices at which they respectively proposed to sell their products, to which prices, it is testified, all adhered until someone chose to deviate therefrom, in which event he was "in decency" bound to notify his dinner associates or the members of his committee.

Excepting the feature of trade allot-

ments and money penalties, Gary dinners were in effect pools, with the right reserved to each participant to withdraw upon notice to the others. They differed from pools only in the difference between the binding force of a moral understanding and the legal obligation of an express agreement. They were pools without penalties. They constituted a scheme which did not make it fatal for a competitor of the Corporation to stay out, but made it attractive for him to stay in, the result of which was, that prices were maintained with greater uniformity and stability than when the same participants engaged in pool agreements, violations of which carried penalties.

"Understandings"

This method of co-operation price regulation was pursued uninterruptedly from November, 1907, to February, 1909. Throughout this time, prices were fixed and maintained by "understandings", enforced by "moral obligations". Through the period of depression of 1908, business so decreased in volume, that early in 1909, independent producers broke their "understandings" with the Corporation and with one another, and sold at prices which each fixed for itself in complete disregard of previous "understandings". The Corporation attempted to maintain for its products prices at the figures understood, that is, to maintain high prices in a period of business depression, and "to force the issue against all economic conditions". It attempted this alone, and in its attempt it failed. Therefore, in that year, the Corporation was forced to declare for an "open market", that is, it sold at prices with respect to which there were no "understandings", and permitted "natural laws" to take their course. The immediate results were lower prices and a largely increased volume of trade. If the abandonment by the Corporation of its co-operative policy of fixing and maintaining prices "brought out a large volume of business", it logically follows that by the pursuit of that policy, "a large volume of business" had theretofore been held back, that is, restrained, and therefore that the policy of co-operation as to prices, based upon mutual understandings and enforced by moral obligations, operated effectually and unduly to restrain trade.

That the Corporation did not dominate the industry by compelling the trade to sell at prices it desired, is shown by the break of 1909. When the independents broke away, the Corporation had to break away too. When the independents lowered prices, the Corporation had to lower prices too. When they all broke away, two things happened: First, competition in prices; second, an increased volume of trade, indicating theretofore a limitation of the former and the restriction of the latter. This is persuasive evidence that the establishment and maintenance of prices from 1901 to 1909 were accomplished by the Corporation and its competitors by keeping agreements made by pools and adhering to understandings reached at meetings and dinners.

Coincident with the breaking of prices by the breaking of understandings made or reached at Gary dinners, Gary dinners were temporarily discontinued. It had been contended all along that Gary dinners had nothing to do with the fixation and maintenance of prices, that while stabilizing prices resulted from such dinners, nevertheless their primary purpose was to secure the establishment and maintenance of good relations between competitors, and to afford opportunities for the exchange of trade information and experience. Is it not strange that a breach of an understanding as to the one matter of prices should have caused a discontinuance of the dinners with the consequent loss of their primary benefits.

More Dinners—Higher Prices

Gary dinners were resumed in October, 1909, and with their resumption, higher prices were resumed.

By the proceedings at the Gary dinners, and at the meetings of the dinner committees, the fixing and maintaining of prices were as successfully accomplished as by meetings called for that purpose during the period from 1904 to 1907 and by the pools created for that purpose from 1901 to 1904. It therefore appears that from the organization of the Corporation in 1901 until the Gary dinners were discontinued in January, 1911, the Corporation, first by one method and then by a second method and then by a third method, employed means to procure the establishment and maintenance of uniform prices for its diversified products, and by these means the Steel Corporation, with its competitors, did combine and control prices, and in controlling prices restrained trade. If by the three methods pursued in the three periods named, prices were not artificially and successfully maintained, as shown by the history covering those three periods, I am at a loss to know by what means it would be possible to fix and maintain prices that would unduly restrain trade in the sense of violating the anti-trust law.

The raising and maintaining of prices of steel products from 1901 to 1911 cannot be attributed to the dominancy by the Corporation over the industry because of its size. It was due to co-operation between it and nearly all other producers in a joint effort to raise and maintain prices, in which they persisted and succeeded. Without the co-operation of independent producers, prices of steel products could not have been raised and maintained by the Corporation alone. The offense of the Corporation, therefore, was not its dominancy over the trade, but was an offense precisely similar to that of which every independent and co-operating producer was guilty, and consisted in the act of combining with its competitors to produce an unlawful result. If it had not combined with its competitors, or if they had not combined with it, restraint of trade due to the fixation of prices would in my opinion have been impossible. Therefore, those who participated in such meetings with the intention of doing that which was accomplished, participated in unlawfully restraining trade. I am in nowise convinced that those competing corporations which associated themselves with the Steel Corporation, were forced, either by the conduct or the power of the Corporation, to co-operate with it in fixing prices. The Corporation produced less than 50 per cent of the steel products of the country. Those of its competitors which participated with it in the fixation of prices, produced more than 40 per cent. Those which comprised the 40 per cent could have taken care of themselves and could have competed with the Corporation in prices if they had so desired, and therefore those which comprised the 40 per cent and which co-operated with the Corporation in the methods pursued from 1901 to 1911, did so voluntarily and not because of the dominance of the Steel Corporation. The Corporation dominated only in the sense of contributing substantially to what was done and making attractive what it desired to be done, and the others yielded cheerfully. Their offense was no different from that of the Corporation, and the offense of the Corporation was distinguished from theirs only in the leadership it assumed in promulgating and perfecting the policy.

The record does not disclose the names of all the iron and steel producing concerns which were represented at the Gary dinners and which co-operated in the price fixing policies there inaugurated and pursued. Those corporations which were of sufficient size and importance to secure representation from time to time upon the principal committee and the sub-committees of the Gary dinners, including the Steel Corporation, its subsidiaries and its competitors, appear by stipulation, (record vol. 9, 3745-3750) which is excerpted as follows:

General Committee: United States Steel Corporation. Competitors: Cambria Steel Co., Pennsylvania Steel Co., Bethlehem Steel Co., Jones & Laughlin Steel Co., Central Iron & Steel Co.

Ore and Pig Iron Committee: United States Steel Corporation. Competitors: Shenango Furnace Co., Pickands, Mather & Co., Bessemer Pig Iron Association, Republic Iron & Steel Co., Thomas Iron Co., Sloss-Sheffield Iron & Steel Co., Buffalo & Susquehanna Iron Co., Warwick Iron & Steel Co., Allegheny Ore & Iron Co.

Rails and Billets: Illinois Steel Co., subsidiary. Competitors: Pennsylvania Steel Co., Lackawanna Steel Co., Dominion Iron & Steel Co., Alan Wood Iron & Steel Co.

Billets and Sheet Bars: Carnegie Steel Co., subsidiary. Competitors: Pennsylvania Steel Co., Republic Iron & Steel Co., Lackawanna Steel Co., Jones & Laughlin Steel Co., Youngstown Sheet & Tube Co., Alan Wood Iron & Steel Co.

Structural Material: Illinois Steel Co., subsidiary. Competitors: Bethlehem Steel Co., Cambria Steel Co., Jones & Laughlin Steel Co.

Plates: Carnegie Steel Co., subsidiary Competitors: Cambria Steel Co., Central Iron & Steel Co., Lukens Iron & Steel Co., Worth Bros. Co.

Steel Bars: Carnegie Steel Co., subsidiary. Competitors: Jones & Laughlin Steel Co., Republic Iron & Steel Co., Crucible Steel Co. of America, Cambria Steel Co.

Pipes and Tubular Goods: National Tube Co., subsidiary. Competitors: Wheeling Steel & Iron Co., Youngstown Sheet & Tube Co., Reading Iron Co., La Belle Iron Works.

Sheets and Tin Plate: American Sheet & Tin Plate Co., subsidiary. Competitors: La Belle Iron Works, Inland Steel Co., National Enameling & Stamping Co., Youngstown Sheet & Tube Co.

Wire Products: American Steel & Wire Co., subsidiary. Competitors: Pittsburgh Steel Co., John A. Roebling's Sons Co., Grand Crossing Tack Co.

The anti-trust law was enacted "to protect trade and commerce against unlawful restraints and monopolies". The word "trade" means the buying as well as the selling of property, and the statute extends its protection to those who buy as well as to those who sell. A practice that is helpful to the seller, but is hurtful to the buyer is as fully within the inhibition of the statute as a practice pursued by one seller which unlawfully restrains the trade of another seller. Therefore, it may be assumed without discussion, that the statute intends to protect the purchasing public from the consequences of combinations, which, either in their purpose or effect, so raise and maintain prices, that trade, in the sense of buying, cannot exist except upon terms fixed by combinations of sellers.

When the Steel Corporation and its competitors, which together produced 90 per cent of the iron and steel output of the country, combined, and first by one method and then by another and then still by another, deliberately fixed and successfully maintained almost uninterruptedly for a period of ten years, the prices at which the public was compelled to purchase their products, I am convinced that the Corporation and every producer which combined with it and with one another in so fixing and maintaining prices, violated the provision of the statute which declares illegal "every * * * combination * * in restraint of trade or commerce among the several states * * *".

Restrain or Threaten?

Fourth:—Was the Corporation engaged in restraining or monopolizing trade, or was it threatening so to do at the institution of this suit?

As the several means resorted to by the Corporation with others for raising and maintaining prices, constitute, in my opinion, the only conduct of the Corporation violative of the statute, the first part of the question just propounded may be answered by ascertaining when that conduct ceased. The Gary dinner movement ended with the dinner of Jan. 11, 1911, and the bill in this suit was filed on Oct. 26, 1911. The testimony does not show, that since the date of the last Gary dinner, the Corporation either alone or in co-operation with others, has fixed or maintained prices of the products of the steel industry, or attempted so to do, nor does the testimony disclose anything which suggests an intention on the part of the Corporation to return to its former practices. That it may do so, if it desires, unless prevented by the decree of this court, is of course obvious.

Conclusions

My conclusions of fact and of law are, that the organizers of the Corporation (1) intended to create a monopoly and to restrain trade, and (2) combined with others and attempted to monopolize trade, within the meaning of the act; and that the Corporation (1) neither attempted, nor possessed the power, alone to do the unlawful things intended by its formation, but (2) that it unlawfully combined with others to restrain trade by controlling prices.

Whatever remedy there may be against the organizers of the Corporation for acts violative of the statute, certainly in this proceeding in equity, a decree of dissolution cannot be awarded against the Corporation for the unlawful intent and the unsuccessful attempt of its organizers to violate the law. Upon the finding that the Corporation, in and of itself, is not now and has never been a monopoly or a combination in restraint of trade, a decree of dissolution should not be entered against it. Having found, however, that the Corporation violated one of the provisions of the statute by combining with others to unduly restrain trade, and that it possesses the power to again unlawfully combine with others to do the same unlawful acts, and though not actively threatening, yet because of the disposition displayed throughout the larger portion of its history, it may again do so, I am of opinion, that the Corporation should be prevented doing the things and repeating the practices respecting the fixing and maintaining of prices herein viewed illegal. The ordinary relief, obviously, is the injunctive process of the court, which in an ordinary situation would follow such a finding, as of course. I am satisfied, however, that the same end will be attained, in a manner consistent with recent legislation, by retaining jurisdiction of the bill, if desired by the government, for the purpose of restraining the defendants from engaging in the price fixing practices found illegal.

Having stated the reasons for my conclusions and the matters which have principally controlled my judgment in this case, I join in the decree to be entered.

Will Build New Plant.—Announcement has been made by the Birmingham Stove & Range Co. that a new plant is to be erected at once in Birmingham at a cost of about $100,000. The old plant of the company was recently destroyed by fire.

Corporation Fair to Laboring Men

By J. G. Benedict, Secretary Landis Machine Co., Waynesboro, Pa.

WE BELIEVE the Steel Corporation decision is strictly in harmony with fair-minded business from the fact that the Corporation on every point shows it has been inclined to be reasonable both as to prices and very fair; in fact, more fair to their laboring men than 90 per cent of the other manufacturers throughout the United States, especially from a point of giving all their employes an opportunity of procuring holdings in the business and sharing the profits thereof.

Secondly, we believe it will have a favorable effect on business. Just how great an effect we are unable to predict, but we do feel that should the International Harvester Co. now win their suit also, it will go a long way towards checking so very much reckless trust legislation and unprincipalled investigation.

There is no question but that a corporation should be made to abide by the civil laws and the rights of the people as well as an individual should, but at the same time there has been much jumping of corporations that is uncalled for and wholly beyond reason, and until this is checked and brought to a more definite and fairer basis, business will not reclaim its own, although we believe this time is approaching, and if not before, we think it will at least arrive by the time the present administration comes to a close.

Scrap Warehouse

Chicago, June 8.—Hyman-Michaels Co., with principal offices at Chicago, has established an office, scrap yard and warehouse at Bulwer and Adelaide avenues, St. Louis. The yards are equipped completely for handling a large volume of business in scrap iron and relaying rails. T. J. Kiener, who has been in this line of business in St. Louis for many years, will have charge of the new office, and L. F. Kramer, who has been in the company's office in Chicago for many years, will be in charge of the operating department.

Great War Has Advanced Business

And Domestic Demand is Improving—Such Was Belief Prevailing at Convention of Machinery Manufacturers and Dealers at Philadelphia

The consensus of opinion at the joint convention of the American Supply and Machinery Manufacturers' Association and the National Supply and Machinery Dealers' Association, held at the Bellevue-Stratford hotel, Philadelphia, June 3 and 4, was that business conditions in the United States have reflected much improvement over the last few months, as a result of the war boom. The members of the two associations spoke of the future with cheerfulness, and there was a well defined belief that the termination of the war—whenever that comes—will be followed by a flood of business. Aside from the war orders and the resulting activity, most of the dealers and manufacturers reported a steady improvement in general business conditions. One subject which was commented on quite generally, in an informal way, was the decision in the United States Steel Corporation dissolution suit. The fact that the Steel Corporation won its case on all points involved was noted with great satisfaction by the members of both associations. The joint conventions, which were well attended, were featured by discussion on a number of important topics. One of the most important actions taken by the American Supply and Machinery Manufacturers Association was the passing of a resolution which is likely to lead to a resumption of the "triple conventions," held in former years by the American Supply and Machinery Manufacturers' Association, the National Supply and Machinery Dealers' Association and the Southern Supply and Machinery Dealers' Association. This resolution declared it to be the consensus of the meeting that whenever it is found to be impracticable to arrange for a joint meeting of the three associations, the American Supply and Machinery Manufacturers' Association should meet with each of the other associations. The discussion in regard to the resolution revealed the fact that a large number of the members of the manufacturers' association attended the southern convention unofficially each year and it was considered advisable that the manufacturers association hereafter be represented at the southern conventions in an official capacity.

C. M. Ripley, of Richard D. Kimball Co., New York, one of the speakers at the manufacturers' convention, submitted a very severe criticism of the methods used by public service companies in persuading manufacturing plants, hotels, etc., to discontinue their power plants and replace them by using power supplied by the service company. Mr. Ripley set forth numerous figures showing that manufacturers in nearly all cases, can secure more economical results by operating their own power plants than by purchasing power from a service company. Another speaker was Dr. Robert Grimshaw, of the New York University School of Commerce, Accounts and Finance. Dr. Grimshaw predicted that the belligerent countries in Europe, at the termination of the war, will begin immediately to make great efforts to resume their former manufacturing activity. He said that to compete with foreign countries after the war, it will be necessary for American manufacturers to cut their unit costs to the bone. He recounted statistics showing the cost of production in Europe prior to the war, showing that in a great many cases American manufacturers were at a serious disadvantage. Dr. Grimshaw said that the cost of labor in this country is too high: "We have an unfortunate idea here that high wages mean prosperity," he said, "but this, to my mind is not true. All merchants want good wages, but they want to buy things cheap and the two do not go together."

Dr. Grimshaw criticized our methods of regulating the tariff, saying that changes in tariff rates are effected by individuals who do not bring sufficient specialized knowledge to their task. He called attention to the method pursued in Germany where tariff rates on different commodities are established by experts on the commodities in question. He described numerous experiences in which he was unable to sell locomotives, steel cars, etc., in foreign countries because of the refusal of the buyers there to purchase foreign-made goods. Dr. Grimshaw called attention to the lack of geographical knowledge in this country, which is responsible for a good deal of misdirecting of letters.

At a joint session of the two associations, Thursday afternoon, Dr. Lee Galloway, professor of commerce and industry at New York University, was one of the principal speakers. Dr. Galloway spoke as a representative of the American Fair Trade League and addressed his remarks with reference particularly to the Stevens bill introduced in the last congress. This bill provides for the maintenance of resale prices fixed by manufacturers. The maintenance of resale prices, said Mr. Galloway, is justified for the same reason as entitles the seller of a business to remuneration for so-called "good will." With the sale of a trademark article, he said, something more is sold than the article itself. The speaker urged a hearty support of the Stevens bill. P. F. Bryant, sales manager of Babson's statistical organization, Wellesley Hills, Mass., said business men often make a mistake in not stopping to think that their business is effected by conditions outside their line. He emphasized the necessity of studying conditions. Edw. J. Cattell, city statistician, Philadelphia, delivered an address tinged with humor. The speaker called attention to the vast variety of products made in Philadelphia, saying that these facts disprove the contention that Philadelphia is in a somnolent condition.

The retiring president of the dealers association, Chas. S. Farquhar, of the Chandler & Farquhar Co., Boston, expressed his satisfaction over the great benefits which the existence of the association has made possible to its members, and especially the opportunity it has given them of expressing their views in a manner that would receive attention.

Thomas A. Fernley, secretary-treasurer of the dealers association called attention to the great publicity which has characterized association work in recent years. This, he said, contrasts sharply with the policy of secrecy which formerly used to be adhered to by most trade organizations. That this changed attitude on the part of such organizations has been for the best, he said, is proved by the manner in which the public and the government now respect and consult the views of business men as expressed through such organizations. As an example, Mr. Fernley pointed out especially the Chamber of Commerce of the United States which takes a referendum upon questions of natural importance and reports the result to the president and his cabinet and to the federal legislators. The association, he said, through its advisory

secretary-treasurer, T. Jas. Fernley, had opened relations with the new federal trade commission and expressed an intention to develop these relations further at a later day. Much information, said Mr. Fernley, has been collected from the members relative to their method of keeping records of merchandise on hand and ordered, on the methods of pricing goods and systems of keeping price records, etc., and this at all times is available to every member. During the year, he said, the association has been instrumental in relieving members of goods in which they were overstocked by transferring portions of such stocks to other members.

New officials elected by the American Supply and Machinery Manufacturer's Association to serve during the coming year, were as follows: President, Farnham Yardley, Jenkins Bros., New York; first vice president, H. E. Dickerman, Chisholm-Moore Mfg. Co., Cleveland; second vice president, C. W. Miller, Jeffrey Mfg. Co., Columbus, O.; third vice president, Geo. E. Hall, Boston Woven Hose & Rubber Co., Boston. The executive committee was chosen as follows: A. Wagner, chairman, American Iron & Steel Mfg. Co., Lebanon, Pa.; Edw. A. Ludden, Detroit Oak Belting Co., Detroit; Jos. H. Grubb, Hussey, Binns Shovel Co., Pittsburgh, E. F. Cooper, Henry Disston & Sons, Inc., Philadelphia; Chas. A. Graham, Graham Nut Co., Pittsburgh.

The National Supply and Machinery Dealers' Association elected new officers as follows: President, Herbert W. Strong, Strong, Carlisle & Hammond, Cleveland; first vice president, W. J. Radcliffe, E. A. Kinsey Co., Cincinnati; second vice president, C. Morgan, Hardware & Supply Co., Akron, O. The members of the executive committee were chosen as follows: Chairman, W. T. Todd, Sommers, Fittler & Todd, Pittsburgh; E. D. Hunn, C. S. Mersick & Co., New Haven; Geo. Vonnegut, Vonnegut Hardware Co., Indianapolis; A. M. Maddock, Maddock & Co., Philadelphia. The nominating committee was as follows: W. L. Rodgers, Pittsburgh Gage & Supply Co., W. A. Ridings, Syracuse Supply Co., Syracuse, N. Y.; S. A. Courson of E. Keller Co., Williamsport, Pa.; C. H. Mueller, Phillip Gross Hardware Co., Milwaukee; W. B. Yost, Stambaugh-Thompson Co., Youngstown, O.

Pittsburgh Chosen.—Pittsburgh was chosen as the 1916 convention city of the American Iron, Steel and Heavy Hardware Association at the final session of the sixth annual convention, recently, at San Francisco. Officers elected for the year were: President, Jesse E. Gregg, St. Paul; vice president, Henry Bodevin, Brooklyn; secretary-treasurer, John G. Purdie, New York; members of the executive committee, Richard R. Englehard, Davenport, La.; Herbert Field, Providence, R. I.; Eugene J. McCarthy, Buffalo, and George S. Scovel, San Francisco.

Many Millions

Being Expended for Shells Awarded to Canadian Manufacturers

Toronto, June 8.—Col. A. Bertram, chairman of the government shell committee, states that the orders placed by the British war office with Canadian manufacturers for shells amount to more than $154,000,000. This is exclusive of the large orders from the other allies, or the contracts for other war munitions from Britain. Since February, when the first shipments of shells were made, the average daily shipments have increased to 10,000. Already 430,000 shells have been sent. Every available machine shop, railroad shop and plant capable of making shells or their parts is employed and the number is steadily increasing. A telegram received from Lord Kitchener stated that the Canadian plants were turning out more shells than all the manufacturing establishments in Britain, exclusive of regular shell-making firms.

The Ross rifle factories are turning out 6,000 rifles per month, having reached this maximum as a result of enlargements and improvements to the plant. It is understood that the order from the British war office calls for 100,000 rifles, and that the company was obliged to refuse a large order from the Russian government.

The Ottawa Car Mfg. Co. is making big guns, having installed special machinery for the purpose. It is at present the only establishment in Canada where complete artillery is made.

The Canadian Cartridge Co., Ltd., has been organized by Hamilton, Montreal and Toronto capitalists, with W. F. Baillie, Toronto, as president, and is building a plant at Hamilton, to cost about $30,000. Two hundred men will be employed and $150,000 spent in the purchase of heavy machinery.

The Hamilton Lock-Nut & Specialty Co., Ltd., has acquired a large building on Gage avenue, Hamilton, which will be converted into a factory. The company will specialize on a newly patented lock nut and an auto wheel, but will manufacture other lines. M. J. Dunham is president; J. T. Stroud, vice president and secretary, and W. J. Sutterby, superintendent.

The Dominion Wheel & Foundries, Ltd., of Toronto, is busy on large contracts for car wheels for France and Russia, and next week will begin the erection of a large addition to its plant. The company has also leased and opened up the car wheel foundry of the Eastern Car Co., at New Glasgow, N. S.

J. A. Kirkpatrick, of Toronto, president of the Copp Stove Co., of Fort William, Ont., states that the company, having received a contract for 50,000 shells for the British government, will make an extension to its factory and install $60,000 worth of new machinery.

The Polson Iron Works, Ltd., Toronto, has under construction a gasoline motor tug, the first of its type to be built in Canada, for the Hudson Bay Co. It is to be used for lighting vessels which cannot reach the docks at Fort Churchill, and on account of the heavy seas prevailing in that district will be constructed on the submarine principle to be operated entirely from the inside.

The Ontario bureau of mines has commissioned Arthur L. Parsons, of Toronto University, to make an investigation of the iron ranges of Hunter's island, west of Port Arthur.

Fire Brick for Navy Yards

The Louisville Fire Brick Works, Highland Park, Ky., was recently awarded the yearly contract for furnishing all the fire brick material to the various navy yards of this country. This contract was awarded the company although its prices were somewhat higher than those of some of its competitors. It has furnished fire brick to the government for several years and its material was evidently preferred. This contract amounts to about 75 to 100 carloads and was secured over 17 bidders. This company recently received an inquiry from far-away Madras, India.

General Refractories Co., with main offices in the Trinity building, New York, has opened a branch office at 1739 Continental & Commercial National Bank building, 208 South La Salle street, Chicago. F. R. Minton is manager.

The Industrial Works of Bay City, Mich., has established as its Pacific coast agents, N. B. Livermore & Co., of San Francisco and Los Angeles, and the Northwestern Equipment Co., of Seattle and Portland.

Money and Iron: Fact and Comment

Decision in Steel Corporation Suit Has Stimulating Effect on Stocks, But There is No Hysteria

AFTER the two holidays of Sunday and Monday, the market opened somewhat easier Tuesday. There were general advances Wednesday, which were continued Thursday, when Steel common made an advance of 4½ points and figured to the extent of about 25 per cent of the total of the day's sales. Announcement of the decision in the Steel Corporation case was made after the stock market closed Thursday. Friday was a day of rejoicing for the business men of the country and there was a general movement in stocks upward. There was, however, no great excitement or unjustified advance. Steel common moved up 1¼ points and preferred 3¼. International Harvester gained 6 points, Republic Steel common lost ⅜ of a point, Republic preferred gained 1 point. The Saturday half-day was quiet with the exception of advances in motor stocks. Steel lost 1⅛ points and Republic Steel 1 point.

Quotations at the close of business June 5 and changes in the leading stocks identified with the iron and steel industry for the week are shown in the following table:

	Close June 5.	Net change.
Amer. Brake Shoe & Fdy. Co.	102⅛	+1⅝
Amer. Brake Shoe & Fdy. Co., ctfs., prfd.	150	.....
American Can	41½	+4¾
American Can, prfd.	100	+3½
Amer. Car & Foundry Co.	54	+2½
Amer. Car & Fdy. Co., prfd.	113	+1½
American Locomotive	48¼	+2½
American Locomotive, prfd.	93¼	+ ¼
American Steel Foundries	33	—1
Baldwin Locomotive	50	+2
Baldwin Locomotive, prfd.	103½	+2¼
Bethlehem Steel	148½	+11½
Bethlehem Steel, prfd.	114	+2
Colorado Fuel & Iron	30¼	+ ¼
Continental Can	64	+5½
Continental Can, prfd.	96½	+ ½
General Electric	164	+12
International Harv. of N. J.	104	+9½
Inter. Harv. Corp.	...	.....
Inter. Harv. Corp., prfd.	97	—3
Nat'l Enamel'g & Stamp. Co.	16	+ ½
Nat'l En'm & Stamp. Co., prf.	83	+1
Pressed Steel Car	47¾	+3¾
Pressed Steel Car, prfd.	99	+4
Pullman Palace Car	156½	+1½
Republic Iron & Steel Co.	28¾	+1
Republic Iron & Steel Co., prf.	86	+2½
U. S. Cast Iron Pipe & Fdy.	14⅜	— ⅛
U. S. Cast Iron Pipe & Fdy., prfd.	...	.....
United States Steel	59½	+4¾
United States Steel, prfd.	110½	+3⅞
Westinghouse Mfg.	96½	+3½

Will Have Stimulating Effect on Business

By Joseph G. Butler Jr., Youngstown, O.

THE decision of the United States court in the matter of the proposed dissolution of the United States Steel Corporation is eminently fair and in harmony with justice and fair dealing. I consider it a great victory for the Corporation as well as for the independents. The suit could not have been won but for the cordial co-operation of the officials of the large independent concerns and their testimony appeared to me as it was given as decisive.

I think the decision will have a stimulating and healthy effect on general conditions and will be an additional factor in restoring confidence which is the basis of all businesss successfully managed.

The case was handled by the Steel Corporation officials and attorneys in a most fair and equitable way; it appeared to me at times in reading the testimony that Judge Gary was anxious that both sides of the case should be fully presented to the court. If the administration, after being beaten in five successive cases, would "stand pat", it would have a still further good effect on business and be in line with what President Wilson has repeatedly promised.

Dominion Steel Corporation

The earnings statement of the Dominion Steel Corporation for the year ended March 31, 1915, shows a severe shrinkage in earnings.

The balance available for dividends on the subsidiary preferred stocks was $435,256. The Coal dividend, taking $210,000, was paid in full, but the Steel dividend for the full year was deferred. The corporation, therefore, carried forward $225,256 out of the year's earnings. It would have required $124,744 more earnings to have shown the dividend of Steel preferred fully earned.

Net earnings for the year, before making provision for depreciation, sinking funds, etc., were $3,571,058, a decrease of $870,973, or approximately 20 per cent. The corresponding decline in Nova Scotia Steel was 67 per cent. Depreciation allowance was about $17,000 higher; interest charges, being carried forward to profit and loss about $74,000 higher, and discount on bonds and notes sold, about $37,000 higher. After all deductions under these heads, a balance of $855,256 remained available for the dividend on the corporation's $7,000,000 preference stock. This was $999,569 less than the corresponding balance the previous year, a decrease of 54 per cent, while the proportion of earnings shown on the stock fell from 26.5 per cent to 12.2 per cent. The only deduction after the $420,000 for the preference dividend was $210,000 for the Coal preferred dividend, a balance of $25,256 account. A year ago, when the full preferred dividends and three quarterly dividends on the common stock were paid, the company reported a deficit of $86,105. In his report J. H. Plummer, president, said:

"The operations of the Coal company were affected unfavorably by the closing down for some months of the Steel plant, but its business was, on the whole, well maintained. The prospects for the coming year are good, but the requisition of our colliers by the Admiralty is seriously affecting the question of transportation. In the early part of the year a distinct revival in the demand in Canada was apparent, but business came to a standstill with the outbreak of the war."

Lack of Machines Restricts Sales

Dealers Scouring the Country Are Unable to Locate Enough Tools to Supply the Market—Domestic Inquiries Continue Active in the East

AS WAS the case last week, the volume of business in the machinery market continues much smaller than would be the case were the dealers and manufacturers able to supply the demand. Inquiries continue active and urgent from domestic manufacturers engaged in turning out war materials; demand from abroad also continues active and urgent. On all sides, buyers are becoming more willing to contract for future delivery, however, since their experience of late has shown them that by postponing their buying they succeed only in putting off still farther the delivery they can secure. This is the case with all kinds of machinery used in the manufacture of war munitions, but especially with lathes, screw cutting machines, etc. In one case within a week a buyer after letting an engagement, in reference to a number of lathes he could have had for July shipment, lapse for half an hour, he found the dealer had disposed of these lathes and had nothing better to offer than late August delivery. It is almost impossible now to get lathes before September.

Of considerable interest is the awarding of the contract for the equipment for what is to be the largest rifle plant in the country—namely, the immense new plant which the Baldwin Locomotive Works is erecting at Eddystone, Pa. The Baldwin company has entered into an arrangement whereby the Remington Arms-Union Metallic Cartridge Co., Bridgeport, Conn., is to purchase the equipment and material. The latter company holds the contract for the rifles and cartridges which are to be made. A large number of companies, previously reported in *The Iron Trade Review*, continue to figure on further contracts for war materials of different kinds. Among concerns which have just taken up negotiations on such contracts are the International Steam Pump Co., at its Harrison, N. J., plant; the Railway Steel Spring Co., New York, and the Collingwood Ship Building Co., Toronto, Can.; these interests probably will go into the manufacture of shrapnel. Other concerns which previously booked war orders and which continue to buy are the Nathan Mfg. Co., New York; the American Locomotive Co., etc. The Jersey City, N. J., board of education has opened bids on 24 14-inch engine lathes, one 16-inch engine lathe, one shaper, one planer, milling machines, and miscellaneous tools and woodworking equipment. The Newark, N. J., board of education will open bids on June 17 for four 14-inch lathes, one shaper, one drill press, and miscellaneous equipment for the Boys' Industrial School. Snead & Co. Iron Works, Jersey City, N. J., is in the market for a number of lathes.

Pittsburgh Expects June to Be Best Month in Years

The Pittsburgh machinery market continues its march of improvement and dealers are confident June will prove to be the most attractive month enjoyed for many years. Sellers are unable to obtain lathes for anything like prompt delivery. Westinghouse interests continue to quietly buy tools for plants in this district and in the east. The Aluminum Co. of America is increasing capacity at its works at New Kensington, Pa., and, as previously reported, has purchased some equipment. The Carnegie Steel Co. has closed negotiations for additional punches and shears for its Homestead works, and the McKeesport Tin Plate Co., McKeesport, Pa., is expected to buy equipment for the proposed extension at an early date. The Standard Steel Car Co., which has taken some attractive orders for shells, will rebuild its plant at Newcastle, Pa., which recently was damaged by fire. Builders of heavy rolling mill equipment are enjoying fairly satisfactory conditions, although no large shingle orders have been placed recently.

Increased Demand Covers Wide Range at Chicago

Increased demand from general machine shops for tools of a wide range characterizes the situation in Chicago at present. Dealers find sales are handicapped by deferred delivery, four to six months being necessary in many instances where desired tools are not in stock. Higher prices also have been a deterrent, as users hesitate to pay the advance of about 25 per cent over former prices. It is only in cases of insistent need, where profits can be seen immediately, that the price cuts no figure.

Railroads having lists before the trade have made some protests against the higher quotations, but assurances that further advances may be expected has hastened consideration of requirements and both the Santa Fe and the Burlington are nearly ready to place their orders. The North-Western has not yet issued its list. However, railroads are buying to some degree, the Rock Island recently taking a 36-inch lathe for use in its Kansas shop and the North-Western purchasing a rail cutting plant from Jos. T. Ryerson & Son. This consists of a high-speed friction saw and a rail drill for use in the company's plant at Butler, Wis.

Business now is being done at high pressure, sales being made by telegraph and long distance phone and shipments being by express in many instances. A lathe weighing 15,000 pounds when boxed for ocean shipment has been forwarded by express to Baltimore from Chicago for shipment to the Pacific coast. Charges to Baltimore represented about one-third the price of the machine.

Few lathes and screw machines are available in this market, but dealers are alert for every possibility of buying and in some instances have bid on entire plants, including real estate and buildings to obtain equipment which is in demand, secure in the certainty a profit can be realized.

Cincinnati Machine Tool Builders Discriminate

In Cincinnati, the machine tool market is in a muddle. The larger manufacturers are taking only choice contracts, and are disregarding orders that would have been welcomed a year ago. The market is still flooded with inquiries for prompt deliveries, and in almost all cases, better prices are being offered for spot shipment. An inquiry for 200 lathes from Italy has gone begging because no plant here can produce them within the stipulated time. A Cincinnati firm is in the market for 200 grinders for

A Real Test of Flooring Quality!

The *Thew Automatic Shovel Company, Lorain, Ohio,* is a busy plant. It has been for many years.

The floorings of its shops often have to put up with some very harsh treatment, for the employes do not always have time to use them gently.

That is why Ayer & Lord Interior Wood Blocks were installed here—efficiency, durability and economy were required—*and they were obtained.*

Ayer & Lord Tie Company

General Office: Railway Exchange, Chicago

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KANSAS CITY, MO.
1117 Rialto Bldg.

MEMPHIS, TENN.
1402 Exchange Bldg.

PHILADELPHIA, PA.
319 Perry Bldg.

We are continually getting letters like this

Here is what one "Ayer & Lord" convert says:

"We are very glad to state that the wood paving blocks which we used for some of our floors, *after all other material had proven a failure,* are very satisfactory. These wood blocks seem to be about the only thing that will answer our purpose.

"We will say in this connection that the floor is exposed to extreme heat, also to extremely hard usage owing to our trucks being very heavy and having small wheels."

light work, which, it is reported, will be sent to Europe. New orders have been few during the past week, because order books of most machinery manufacturers are full for several months. The general demand is heaviest for lathes, radial drills, milling machines and planers, in the order named.

EASTERN STATES

KEENE, N. H.—A. E. Martell Co., 159 Devonshire street, Boston, has let a contract for a 1-story, 120 x 250-foot factory, a 2-story, 26 x 33-foot power plant and a 30 x 40-foot office building to be erected in Keene.

BARRE, MASS.—Old Heald Foundry on Valley road at Heald village near here was damaged by fire. The foundry, which had been idle for several years was owned by Leander S. Heald and was a 1-story building, 40 x 80 feet, with 30 x 50-foot L.

BOSTON.—American Steam Gauge & Valve Co. is to erect an addition to its plant for filling war contracts.

BOSTON.—Architect F. A. Norcross has plans ready for a manufacturing building to be erected at 18 to 20 Oxford street for S. Rose and others of Cambridge, Mass.

BOSTON. — Master Combination Lock Co. has been incorporated; $25,000 capital stock; by James F. McHugh, Harry H. Matthews and Robert A. Jordan.

BOSTON.—Fire in the 4-story, brick building, 32 Dorchester street, South Boston, caused some damage to plant of Geo. Q. Hill Co., which operates a brass machine shop. The Hub Metal Co., also located in the building, sustained a slight loss.

LAWRENCE, MASS. — Merrimack Foundry & Machine Co. is planning to move to a new location, where it will have the benefit of a side track and more land.

MAYNARD, MASS. — Mullin Construction Co. has been incorporated; $10,000 capital stock; by William J. Cronin, Stephen C. Bresnahan and Charles D. Conture.

SPRINGFIELD, MASS. — Westinghouse Electric & Mfg. Co. has organized and incorporated under the laws of Massachusetts the New York England Westinghouse Co. The new company will operate the plants of the J. Stevens Arm & Tool Co. and the Stevens-Duryea Co. at Chicopee Falls and East Springfield, recently purchased by the Westinghouse interest. While these plants will be devoted mainly to the manufacture of rifles, they also will turn out shells in large quantities.

SPRINGFIELD, MASS. — Fisk Rubber Co, which will start work shortly on the erection of three buildings to be completed by Dec. 1, announces that additional buildings to be used for factory purposes will be started about Jan 1. The structures now about to be erected include a 60 x 160-foot, 6-story office building, the first two stories to be of stone with the others of tapestry brick; a 2-story, stone branch store and service station, and a 6-story, 110 x 310-foot, reinforced concrete store house. It is stated when all of the proposed buildings are completed, about 5,000 men will be employed; at present about 3,000 are engaged.

QUINCY, MASS.—Fore River Ship Building Corporation has let contract to Aberthaw Construction Co., Boston, for erection of a 2-story and basement machine shop.

TAUNTON, MASS.—Weir Stove Co. has let a contract for its proposed 1-story, 65 x 160-foot foundry.

WORCESTER, MASS.—Baldwin Chain Co., 199 Chandler street, has commenced work on a 1-story, 17 x 117-foot foundry addition.

WORCESTER, MASS.—Halstead Machine Co. recently incorporated with a capitalization of $50,000 to manufacture automatic grinding machines, advises it does not expect to build at the present time, but will be in the market shortly for equipment and machinery. John Alden Thayer is president.

BRIDGEPORT, CONN. — Locomobile Co. of America has let contract for still another addition, 4-story, 54 x 104 feet.

BRIDGEPORT, CONN. — Crane Co. has decided to enter into the manufacture of shrapnel and is equipping a portion of its West End plant for this purpose.

BRIDGEPORT, CONN. — Lake Torpedo Boat Co. has started work on an addition to its office building, which is to be 2-story, 33 x 117 feet.

BRIDGEPORT, CONN. — Bridgeport Projectile Co. has been granted a permit to erect a 1-story, brick and steel forge shop, and a 2-story brick and steel factory building.

BRIDGEPORT, CONN.—Remington Arms-Union Metallic Cartridge Co., is commencing work on five more additions to its large plant here. They will include two five and three 1-story structures.

BRIDGEPORT, CONN.—Work has been started on two more buildings for the Bridgeport Arms Co., each five stories and 62 x 275 feet, with L's, 50 x 87 feet. Thus seven of the 13 buildings for which the plans provide, either have been completed or are in the course of erection.

GROTON, CONN. — New London Ship & Engine Co. advises the only addition now being erected at its plant is a 3-story structure. The company plans beginning work shortly on a large extension to its shop.

NEW BRITAIN, CONN.—Stanley Works, it is announced, recently took a large contract for making shrapnel parts.

NEW HAVEN, CONN.—Mysto Mfg. Co., which just has completed a new plant, has let a contract for a 2-story addition, 61 x 62-feet.

NORWICH, CONN. — Norwich-New York Propeller Co. has plans prepared for the erection of a plant in Norwich.

PLAINVILLE, CONN.—Trumbull Electric Mfg. Co. is enlarging its office building.

WATERBURY, CONN.—Waterbury Hair Spring Works will erect an additional story to its factory building on Jefferson street in July.

PROVIDENCE, R. I.—Gilbert R. Parker, 18 State House, is receiving bids till June 17 for a central power house and equipment.

AUBURN, N. Y.—Columbian Rope Co. has let contract for two 1-story additions.

BUFFALO. — American Radiator Co. has let a contract for its proposed foundry and storage building, 222 x 234 feet, to be erected on Elmwood avenue.

BUFFALO.—Automobile-Aviation Industries Co., 322 Pennsylvania street, recently incorporated, is looking for a site on which to erect a plant.

LONG ISLAND, N. Y.—General Vehicle Co. has booked a war contract and is purchasing a considerable quantity of new equipment.

NEW YORK.—Floating Wedge Lock Nut Co has been incorporated; $50,000 capital stock; by C. E. Eckel, M. S. Wilson and H. H. Miller, 140 Nassau street.

NEW YORK.—A $4,000,000 organization has been formed by Edward M. Hyde, New York, former president of the Bath (Me.) Iron Works, for the construction at Mobile, Ala., of a large ship building plant. Mr. Hyde says the plant will occupy 15 acres, with equipment for building 600-foot vessels, including an 800-foot dry dock and a marine railroad. It is expected contracts for equipment will be closed immediately. The concern which probably will be called the Gulf City Ship Building Co., is said to be backed by steel interests in Birmingham, Ala. It is planned to have the project in operation within six months.

ROCHESTER, N. Y.—J. H. Oberlies, 838 Granite building, architect, is taking bids on a two-story, 84 x 207-foot addition for the W. H. Clark Co.

SCHENECTADY, N. Y.—General Electric Co. continues to inquire actively on machinery for making shrapnel.

WATERTOWN, N. Y.—Northern New York Utilities Co. plans the erection of a $60,000 gas plant in Watertown.

WELLESVILLE, N. Y. — Kerr Turbine Co. has booked a war contract and is purchasing a large amount of equipment.

ARDMORE, PA. — Auto Car Co. has awarded a contract for a 3-story, 60 x 96-foot addition to the factory to William R. Dougherty.

CONCHOHOCKEN, PA.—M. Haupt, architect, Drexel building, Philadelphia, is taking sub-bids on a factory for this city, brick and steel, four stories, 40 x 90 feet. The owner's name is withheld.

ERIE, PA. — National Forge & Tool Co. has been incorporated; $50,000 capital stock; by Frederick J. McCoy, Clinton E. Wilder, Andrew J. Gillespie, John S. Gillespie and E. P. Caulfield.

FARRELL, PA.—The Farrel club has indorsed the plans to erect a bridge across the Haywood hollow at Hamilton avenue.

KOPPEL, PA.—Pittsburgh, Harmony, Butler & New Castle Railway Co. proposes to build an extension from Koppel to New Galilee, Pa.

MILDRED, PA.—A charter has been filed at Dover, Del., for the Art Coal & Coke Co., Mildred, Pa., to acquire coal, coke, mineral and oil lands of all kinds in western Pennsylvania; capital $2,500,000; incorporators: E. J. Taylor, Mildred, Pa.; Harvey B. Wright, Andrew T. Sherman, Detroit.

MORRISVILLE, PA.—Contract will be let shortly for a $15,000 filtration plant.

NEWCASTLE, PA. — According to Ben Luck, city commissioner, an industrial plant, employing 400 men, is seeking a site near the Penn Motor Co., recently taken over by the Federal Radiator Co.

NEW KENSINGTON, PA.—Aluminum Co. of America will build an 8-story warehouse, 80 x 130 feet; James S. Murray is purchasing agent, with offices in the Oliver building, Pittsburgh.

PITTSBURGH. — Liquid Fuel Combustion Co., has been incorporated with a capital of $500,000, to manufacture, construct, install, operate, lease and sell heating systems for public and private buildings, etc. The incorporators are: Conrad Krause, Alfred J. Reif, John A. Cowan, all of Pittsburgh.

SAYRE, PA.—Lehigh Valley railroad has let the contract for the erection of its $400,000 roundhouse in Sayre, containing stalls for 50 locomotives.

SMITHTON, PA.—Bids are being asked by the secretary of the borough of Smithton, Westmoreland county, Pa., for 72 tons of cast iron pipe and fittings and 29 gate valves.

SOMERSET, PA. — Baltimore & Ohio railroad will erect a new passenger station.

WEST CHESTER, PA. — The county commissioners are asking bids on construction of five bridges.

WILKESBARRE, PA — Architects Sturtevant and Poggi, Coal Exchange building, are drawing plans for large colliery shops to be erected in Wilkesbarre by the Lehigh & Wilkesbarre Coal Co. at a cost of about $200,000.

ELIZABETH, N. J.—Union county board of

The Most Accurate, Rapid and Economic Means

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SHRAPNEL and HIGH EXPLOSIVE SHELLS

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BAILY AUTOMATIC ELECTRIC FURNACES

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Maximum variation in temperature 5 deg. F.

No pickling required between operations.

Automatic arrangement prevents chance of error in temperature, time or other variables present in any other type of furnace of whatever nature.

COST PER TON LESS THAN BY OIL OR GAS.

The Electric Furnace Company of America

Alliance, Ohio

freeholders has sold $45,000 bonds for the erection of the Baltic street bridge over the Elizabeth river.

GARWOOD, N. J.—Hall Signal Co. is figuring on a war contract and is inquiring on a large amount of machine tool equipment.

HAMPTON, N. J.—Standard Water Systems Co., 90 West street, New York, manufacturer of water stills, feed water heaters, multiple effect evaporating plants, condensors and tanks, is erecting steel and concrete structures for its new plant in Hampton.

HOBOKEN, N. J.—J. H. Jaeger, 68 Hudson street, will erect a 2-story plant at Park avenue and Boulevard at Weehawken for manufacturing electrical appliances.

MATAWAN, N. J.—Magnolia Metal Co., 115 Bank street, New York, soon will start work on a $20,000 plant here.

NEWARK, N. J.—New Jersey Motor Transportation Co. has been incorporated to manufacture motors and trucks; $500,000 capital stock; by Edward C. Burns, George H. Bradley and William S. Fenderson, all of New York.

NEWARK, N. J.—Dunlap Fountain Co. has been incorporated to manufacture electric fountains; $50,000 capital stock; by Charles A. Dunlap, Edward A. Broeder and W. Howard Demarest.

PATERSON, N. J.—United States Silk Mfg. Co. has been incorporated; $50,000 capital stock; by John Marcus, Samuel Bearson and Bessie Marcus.

BALTIMORE.—Poole Engineering Co. with plant at Woodberry, Md., which recently bought a large amount of equipment to manufacture shrapnel, is inquiring for additional equipment of this character.

WASHINGTON. — An American consul in Scotland reports a firm desiring to get in touch with manufacturers of seamless steel tubes; address bureau of foreign and domestic commerce.

CENTRAL STATES

AKRON, O.—Akron Gas Lamp Co. will erect a $14,000, 2-story, 60 x 80-foot factory building at 606 South High street.

AKRON, O.—Goodyear Tire & Rubber Co. has increased its capital stock from $8,000,000 to $25,000,000. The company recently announced it will add 37,300 square feet to the tire, mechanical goods and waterproof fabric department.

AKRON, O.—Commissioners have asked the court for permission to contract for $20,000 worth of improvements and repairs to bridges damaged by the flood in 1913. These include $10,000 for the Louis Young bridge, Coventry township and $7,700 for the Peninsula canal bridge.

ATHENS, O.—This city plans installing 60 cluster lights on Court street, costing $10,000.

BARBERTON, O. — Portage Rubber Co. has purchased the old plant of the American Strawboard Co. and will erect buildings costing $300,000. F. W. Haglock, architect, Akron, has refused to affirm the report that he is preparing plans for the buildings.

BUCYRUS, O.—Martin Teynor has the contract for the erection of an addition to the Sommer motor plant and will rush work to completion.

CANAL DOVER, O.—The city council has voted to install a complete steam operating plant at the municipal light and power plant. High speed engines to cost $21,000 or a turbine engine to cost $32,000 are being considered.

CANTON, O. — The water committee has prepared a report favoring the erection of a $110,000 iron removal plant for the city water works.

CINCINNATI.—United Shoe Machinery Co. will move to Eighth and Broadway streets shortly, where a portion of a loft building now being constructed, will be occupied.

CINCINNATI. — Wolff Metal Co., manufacturer of stereotype, linotype, electrotype, etc., metals, will construct a new plant on Queen City avenue. Plans have not been prepared.

CINCINNATI. — Gas Construction Co., recently incorporated, is having plans drawn for a factory to be built on a tract of six and a half acres in St. Bernard, for the manufacture of gas ovens. A. L. Pope is secretary and treasurer.

CLEVELAND.—Empire Rolling Mill Co. has increased its capittal stock from $300,000 to $500,000.

CLEVELAND.—M. A. Hanna Dock Co. has changed its name to the M. A. Hanna Coal & Dock Co. and has increased its capital stock from $500,000 to $700,000.

CLEVELAND.—Electro-Galvanizing Co. has been incorporated; $10,000 capital stock; by G. R. Aitken, H. H. Bolton, T. R. Bromley, N. M. Zimmerman, F. M. Fogarty.

COLUMBUS, O.—Ohio Zinc Co. has been incorporated; $25,000 capital stock; by C. A. Phelps, W. S. Warwick, G. W. Warwick, F. R. Chapman and F. P. Jackson.

COLUMBUS, O.—Eureka Mechanical Starter Co., automobile starters, has been incorporated; $30,000 capital stock; by W. A. Rose, J. E. Matthews, C. E. Bonebrake, A. Bunford and Charles E. Ross.

COLUMBUS, O.—Henry Maetzel, city engineer, and G. A. Vorden, service director, have plans in abeyance pending a bond issue of $500,000 for a market house and exposition hall, two stories, 187 x 187 feet.

DAYTON, O.—The legislature has authorized the expenditure and the Dayton State hospital, E. A. Baker, superintendent, will install a $10,000 cold storage plant.

DAYTON, O.—Dayton Power & Light Co. has been granted permission by the state utilities commission to issue $665,000 worth of new securities, $300,000 of which will be used to pay for improvements already under way or completed and $183,425 to purchase the properties of the Miami Light, Heat & Power Co., of Piqua, O.

FREMONT, O.—H. G. Burford Co., recently incorporated with $250,000 capital stock, will take over the Lauth-Juergens Motor Car Co. as soon as the action is ratified by the Lauth-Juergens company's directors. The plant will be worked to capacity building motor trucks exclusively, and may be enlarged later.

MT. VERNON, O. — Fredericktown has purchased the $30,000 worth of stock required to keep the F. V. Zeig Mfg Co., in that town. Buildings will be erected at the new location along the Baltimore & Ohio railroad tracks.

NEWCOMERSTOWN, O.—Ohio Service Co., which owns and operates a power plant in New Philadelphia, O., announces that 10 acres have been purchased near Newcomerstown as a site for a plant, although definite plans have not been formulated.

RITTMAN, O.—R. Winthrop Pratt, engineer, Cleveland, will receive bids shortly for a water works system and plant in Rittman. Mr. Pratt opened bids recently for a sewerage system and disposal plant for this village.

SALEM, O.—A company manufacturing brass and iron bedsteads in Indianapolis is seeking a location in Salem and may take over the plant of the American Case & Register Co. The concern owns $200,000 worth of machinery and proposes selling $70,000 worth of stock.

SPRINGFIELD, O.—Robert C. Gotwald, has prepared plans and will receive bids on a $20,000, 1-story, 35 x 40-foot central heating plant for Wittenburg college. Rev. B. F. Prince is president.

SPRINGFIELD, O.—Steel Transfer Case Co. recently incorporated, advises it will make steel cases for filing invoices, etc. Another shop is doing the manufacturing temporarily, but the company expects to equip a plant of its own shortly.

TOLEDO, O.—American Steel Tube Co. has increased its capital stock from $1,000 to $50,000.

TOLEDO, O.—Standard Steel Tube Co. will erect a 100 x 100-foot addition of saw-tooth construction, having been compelled to double its capacity. New equipment and modern tube-making machinery will be installed. The concern furnishes tubing for the Ford cars and it is said to be shipping more than 9,000 pieces each day to the Ford plant in Detroit.

VAN WERT, O.—Northwestern Ohio Light Co. has been incorporated; $10,000 capital stock; by Lindsey Cooper, U. S. Brandt, J. H. Brandt, C. A. Radcliffe and W. P. Hurd.

WILMINGTON, O.—Work has been started on the proposed foundry of the Wilmington Casting Co., recently incorporated with $30,000 capital stock. Equipment will be installed at an early date.

FAYETTEVILLE, W. VA.—Virginian Power Co., H. G. Scott, general manager, through Mr. Walters, promoter of the Bluefield-Graham electric line, has interested eastern capital in an electric line from Beckley to Fayetteville to cost $800,000 and to pass through 20 mining towns. The Fayetteville railroad company, the New River Co. and county and town governments are interested.

CAMERON, W. VA.—American Save-A-Life Fender Co., represented by L. M. Stevens, Washington, D. C., has completed arrangements with the board of trade for a 2-acre site adjoining the Cameron Glass Co. Work will start July 1 on the erection of a steel and concrete building, 50 x 400 feet, to be completed in six months, with new machinery and electric power for the manufacture of automobile accessories and street car bumpers.

PARKERSBURG, W. VA.—H. H. Archer announces that eastern capital has been interested in the proposed Parkersburg, Charleston & Northern railroad, and that work will go forward. It is said the same capital will finance a line between Marietta and Parkersburg.

PETERSBURG, W. VA. — Pittsburgh-Des Moines Steel Co., Pittsburgh, has been awarded a contract for two 60,000,000-gallon water tatnks by the water commission.

CERULEAN, KY.—The machine and woodworking shop of T. W. Witty & Son was burned recently, the machinery being severely damaged. The estimated loss is $3,000.

GEORGETOWN, KY.—Swift-McNutt Co., Boston, Mass., is dismantling the plant of the Indian Refining, which it recently purchased. Its equipment consists of boilers, engines, tanks, etc.

HORSE CAVE, KY.—J. P. Todd has purchased the local electric light plant and organized the Horse Cave Light & Power Co. to operate it. Some additional machinery will be installed.

LOUISVILLE, KY.—Norman Lumber Co., Ninth and Magnolia streets, is likely to be in the market shortly for a molding machine; address A. E. Norman.

LOUISVILLE, KY.—John Bacon Hutchings & Sons, Columbia building, will receive bids till June 18 for the erection of a $250,000 Y. M. C. A. building to be erected in Louisville. Boilers for a steam heating plant will be needed.

TRENTON, KY.—South Kentucky Power Co. is planning to enlarge its capacity to enable it to extend its service to Guthrie, Ky., and other towns.

WARSAW, KY. — Warsaw Electric Light Co. has purchased a site for its proposed plant and will purchase equipment at once.

WILLIAMSBURG, KY. — H. F. Davis, county engineer, will purchase a considerable amount of road-making machinery.

WINCHESTER, KY. — Broadhead-Garrett Lumber Co., which recently completed the erection of a large saw mill at Nada, Ky., will install an electric light plant in Nada.

ANDERSON, IND.—American Safe & Lock

Co. has been incorporated; $25,000 capital stock; by M. G. Reynolds, R. R. Andrews and J. C. Groble.

COLUMBUS, IND.—H. L. Rust, president of the school trustees, who asked for bids June 8 on a vocational school, will ask for machinery equipment shortly.

EVANSVILLE, IND.—H. E. Boyle & Co. are drawing plans for a new factory for J. Baker & Sons, manufacturers of overalls.

EVANSVILLE, IND. — Evansville Ways Co. has been incorporated to build steamboats and barges; $100,000; by J. C. Greer, Thomas Williams and Charles Fuhrer.

EVANSVILLE, IND. — William Tarrance, care of Savannah Construction Co., Savannah, Ga., has been chosen engineer during construction of the plow works to be built for the Blount Plow Works Co., 1400 Main street, at a cost of $150,000.

FT. WAYNE, IND. — Dudlo Mfg. Co., maker of electric appliances, is to erect an addition, one story, 54 x 80 feet.

HAMMOND, IND.—Plans are in progress for an industrial high school, 172 x 336 feet, by J. T. Hulton & Son, Hammond building; machinery equipment will be needed.

INDIANAPOLIS.—E. Z. Starter & Drive Co. has been incorporated to manufacture automobile starters; $5,000 capital stock; by W. H. Harris, Harry S. Bynum and Orley E. Adams.

KOKOMO, IND.—Haynes Automobile Co. plans the erection of a large addition to its plant on Main street.

KOKOMO, IND. — Kokomo Spring Co., steel springs, has been incorporated; $40,000 capital stock; A. L. Thalman, J. D. Kennedy, A. B. Armstrong.

EAST ST. LOUIS.—Union Sand & Cement Co. is to build a sand hoisting plant at an estimated cost of $10,000.

HERRIN, ILL.—Pittsburgh Filtration Co., Pittsburgh, has been awarded the contract by the city council for the erection of a filtration plant at the city reservoir of Herrin; to cost $18,107.

PLANO, ILL.—Plano Metal Mfg. Co. has been incorporated; $5,000 capital stock; by J. P. Burke, Wm. Foster and C. A. Darnell.

ALBION, MICH.—National Spring & Wire Co. is to erect an addition to its plant 48 x 100 feet.

BESSEMER, MICH.—Newport Mining Co. is to make preparations to work an extension of the Anvil ore body found in the Eureka mine some months ago. A large electric driven compressor and other machinery will be installed.

CONCORD, MICH.—Bonds for $86,000 have been authorized for three bridges on Main and Pembroke streets.

DETROIT.—Federal Motor Truck Co. has increased its capital stock from $200,000 to $500,000.

DETROIT.—B. & W. Auto Accessories Co. has been incorporated to manufacture automobile specialties; $20,000 capital stock; by Robert T. Williams and Ray C. Cowan.

DETROIT.—Detroit Bronze Castings Co. has been incorporated; $2,000 capital stock; by Albert F. Mochrie, Kenneth K. and Millie Hall.

DETROIT.—American Dadco Co. has been incorporated to manufacture automobile and motor boat starters; $200,000 capital stock; by John L. Troy, Charles Seymour, Evan P. Heaton and William F. Carroll.

DETROIT.—Smith, Hynchman, & Grylls, 710 Washington arcade, architects, are preparing plans for a brass foundry, five stories, 90 x 133 feet, for John B. Corlis, 34 Canfield avenue, west.

DETROIT.—Frederick E. Wadsworth, interested in the Michigan Steel Boat Co., Detroit Engine Works and other concerns, has bought a site on which to erect a plant for the manufacture of automobile bodies. Plant is to be 240 x 260 feet; four stories.

DETROIT.—Bids will be received until June 24 by George K. Fenkell, commissioner of department of public works, on a reduction plant, including steel and iron, steel sash and sheet metal. Plans have been prepared by Smith, Hynchman & Grylls, 710 Washington arcade.

FLINT, MICH.—The village of Clio has granted the Flint Electric Co. a 30-year light franchise.

GRAND BEACH, MICH.—Graham, Burnham & Co., 80 East Jackson boulevard, Chicago, have plans in progress for a $1,000,000, 12-story hotel, to be erected at Grand Beach, owner's name being withheld.

Such a Care-Free Life!

Oh! well—
Another week;
ANOTHER MELON.
Below find listed our preferred stock of tips, ready for you to turn into new business.
Note with interest—
Dividends payable
EACH WEEK.

Board of education, Newark, N. J., will open, June 17, for four 14-inch lathes, one shaper, one drill press, and miscellaneous equipment for the Boys' industrial school.

Brennan Steel Castings Co., Cleveland, which has made important improvements to its plant, including a 50 x 150-foot building, will purchase sprue cutting machinery and jar ramming molding machines, etc.

American-Save-A-Life Fender Co. will start work, July 1, erecting in Cameron, W. Va., a steel and concrete factory building, 50 x 400 feet, to be completed within six months. New machinery and electric power will be required for the manufacture of automobile accessories and street car fenders.

Snead & Co. Iron Works, Jersey City, N. J., is in the market for a number of lathes.

Standard Steel Tube Co., Toledo, O., will erect a 100 x 100- foot addition of saw tooth construction, having been compelled to double its capacity. New equipment and modern tube-making machinery will be installed.

Halstead Machine Co., Worcester, Mass., recently incorporated with $50,000 capital stock to manufacture automatic grinding machines, does not expect to build at present, but will be in the market shortly for equipment and machinery.

Bader-Geibel Machine Co., Cincinnati, is in the market for a small number of machine tools.

Prestor & Wade, Canton, Ill., machine builders, are planning to install equipment for a brass foundry.

Timken Roller Bearing Co., operating plants in Detroit and Canton, O., is purchasing equipment for its proposed 100 x 300-foot cold drawing steel mill to be erected in Canton, providing certain facilities are offered.

E. J. Schnoes, 4130 North Monticallo avenue, Chicago, is inquiring for a 3-horsepower alternating current motor, a 3 x 5-inch air compressor with receiver, a 20 to 24-inch arbor press, upright drill and smaller tools.

SOUTHERN STATES

DALTON, GA.—Crown Cotton Mills, George W. Hamilton, president, will erect an additional mill of 15,000 spindles. An option has been taken on the material and machinery for the proposed mill, which will cost about $400,000.

NORTHPORT, ALA.—Bonds of $13,000 have been voted for a municipal water works plant.

NEW ORLEANS.—Port commissioners have commissioned Ford, Bacon & Davis, consulting engineers, New Orleans, to prepare plans for a $750,000 grain elevator.

SHREVEPORT, LA. — Local business men have formed a company with $200,000 capital stock to operate a line of steel barges on the Red river between Shreveport and New Orleans.

FORT WORTH, TEX.—Fort Worth Power & Light Co. has contracted to furnish the electricity for pumping at the water works and needs additional equipment.

HOUSTON, TEX. — Edward Kennedy, W. W. Thomas and J. C. Eganhouse, Houston, have incorporated the Houston, Richmond & Western Traction Co. to build an electric railway from Houston to Richmond, 35 miles.

MIDLAND, TEX.—T. J. O'Donnell is seeking prices on 65 miles of 56-pound relaying rails, spikes, angle bars, etc.

STRAWN, TEX.—Strawn Coal Co. is to install a new electric power plant.

WESTERN STATES

GRAND ISLAND, NEB.—State board of irrigation has granted permission to a company in which F. H. Fritz of Grand Island is interested to establish a power plant on South Loup river to generate 670 horsepower at a cost of $55,000.

LINCOLN, NEB.—Bids will be received until June 22 by Theodore H. Berg, city clerk, for a 500-horsepower water tube boiler and chain grate stoker at the water and light plant at an estimated cost of $9,000.

LAWRENCE, KAN.—Plans are being made for improvements to the water works system to cost $108,000, including new pumping machinery and extensions. F. D. Brooks is city clerk. The plant now is in the hands of receivers.

WICHITA, KAN.—Carl Vitzthum, architect, 53 West Jackson boulevard, Chicago, is taking bids on a 6-story bank, costing $100,000, for the Fourth National Bank.

BUTTE, MONT.—Election will be held July 27 to vote on $100,000 bonds for jail purposes.

JUDITH GAP, MONT.—Plans are being prepared by Gerharz & Jacqueth, Great Falls, Mont., for a $20,000 water works plant.

CODY, WYO.—Park county is planning to erect three steel bridges at a cost of $5,500 each.

CODY, WYO.—Billings Engineering Co., Billings, Mont., has been commissioned to prepare plans for a municipal electric light plant and water works.

EVANS, COLO.—Albert Fry is building a factory to manufacture road dragging machinery.

SANTA BARBARA, CAL.—A. B. Cook, city engineer, will ask bids soon on a $20,000 bridge.

IRON AND STEEL PRICES

Corrected up to Tuesday noon

PIG IRON

(Delivery to July 1.)

Bessemer, valley	$13.65 to 13.75
Bessemer, Pittsburgh	14.60 to 14.70
Basic, Pittsburgh	13.60
Basic, eastern Pa.	13.50 to 13.75
Malleable, Pittsburgh	13.45 to 13.95
Malleable foundry, Chicago	13.00
Malleable foundry, Philadelphia	15.00 to 15.25
Malleable foundry, Buffalo	12.50 to 13.00
No. 1X foundry, Philadelphia	14.25 to 14.50
No. 2 foundry, Pittsburgh	13.45 to 13.95
No. 2 foundry, valley	12.50 to 13.00
No. 2 foundry, Cleveland	13.00
No. 2 foundry, Ironton	12.50 to 12.75
No. 2 foundry, Chicago	13.00
No. 2X foundry, Philadelphia	14.00 to 14.25
No. 2X fdy., N. J. tidewater	14.25 to 14.50
No. 2X foundry, Buffalo	12.50 to 13.00
No. 2 plain, Philadelphia	13.75 to 14.00
No. 2 plain, N. J. tidewater	14.00 to 14.25
No. 2 plain, Buffalo	12.25 to 12.50
No. 2 southern, Birmingham	9.50 to 9.75
No. 1 southern, Cincinnati	12.40 to 12.65
No. 2 southern, Chicago	13.50 to 14.00
No. 2 southern, Phila. delivery	14.00 to 14.25
No. 2 southern, Cleveland	13.50 to 13.75
No. 2 south'n, New York docks	13.75 to 14.00
No. 2 southern Boston, docks	13.75 to 14.00
No. 2 south. interior, New Eng.	14.50 to 15.50
No. 2 southern, St. Louis	13.40
Virginia No. 2X furnace	12.50 to 13.00
Virginia 2X, Philadelphia	15.25
Virginia 2X, Jersey City	15.50
Virginia 2X, Boston points	15.75
Gray forge, eastern Pa.	13.25 to 13.50
Gray forge, Pittsburgh	13.20
Gray forge, Birmingham	8.75 to 9.00
Silveries, 8 per cent, Jackson, O.	14.75 to 15.25
Silveries, 5 per cent Birmingham	12.50
Silveries, 5 per cent, Chicago	16.35
Standard low phos., Phil.	20.00 to 21.00
Lebanon low phos., furnace	16.00 to 16.50
Low phos., Pittsburgh	20.95 to 21.20
Charcoal, Lake Superior, Chgo., Nos. 1 to 4	15.25 to 16.25
Charcoal, Buffalo	15.75 to 17.00
Charcoal, Birmingham	25.00

IRON ORE

(Lower lake ports.)

Old range Bessemer, 55 per cent	$3.75
Mesabi Bessemer, 55 per cent	3.50
Old range, non-Bess., 51½ per cent	3.00
Mesabi non-Bessemer, 51½ per cent	2.85

(Per unit Philadelphia.)

(Prices nominal.)

Foreign Bess., 50 to 65 per cent	7c to 8¼c
For'n non-Bes., 50 to 65 per cent	7c to 8¼c

COKE

(At the ovens)

Connellsville furnace	$1.55 to 1.60
Connellsville fur. contr.	1.65 to 1.75
Connellsville foundry	2.00 to 2.40
Connellsville fdy. contr.	2.25 to 2.50
Wise county furnace	1.75 to 2.00
Wise county foundry	2.10 to 2.40
Pocahontas furnace	1.75 to 2.00
Pocahontas foundry	2.00 to 2.25
New River, foundry	2.50 to 3.00
New River, furnace	2.00 to 2.25

FERRO-ALLOYS

Ferro mang. furnace (prompt)	$115
Ferro mang. Balti. (future)	$95.00 to 100.00
Ferro-silicon, 50 per cent, Pbgh.	71.00 to 73.00
Ferro-silicon, 50 per cent, Phila.	71.00 to 73.00
Ferro-sil., 12 to 13 per cent.	18.00 to 18.50
Ferro-sil., 11 to 12 per cent.	17.00 to 17.50
Ferro-sil., 10 to 11 per cent.	16.00 to 16.50
Ferro-sil., 9 to 10 per cent.	15.00 to 15.50

(Ferro-silicon quoted at furnace Ashland, Jackson and New Straitsville.)

Ferro-carbon titanium, carloads, per lb.	8c to 12½c

SEMI-FINISHED STEEL

Open hearth billets, Phila.	$22.06 to 22.56
Forging billets, Phila.	24.56 to 25.06
Forging billets, Pbgh.	25.00

Freight Rates via Panama Canal

Rates on finished materials, including plates, shapes, bars, wire, nails, etc., to Pacific coast points via Panama canal, per 100 lbs., in carload lots, exclusive of insurance and dockage.

From New York	$0.45
From Pittsburgh	.619
From Youngstown	.639
From Niles	.619
From Wheeling	.619
From Steubenville	.619
From Johnstown	.604
From Coatesville	.545
From Steelton	.555
From Bethlehem	.529
From Cleveland	.65
From Chicago	.765

Rates on sheet mill products $2 per ton higher.

Wire rods, Pittsburgh	$25.00
Billets, Pittsburgh	20.00 to 20.50
Billets, Youngstown	19.00 to 19.50
Sheet bars, Pittsburgh	20.50 to 21.00
Sheet bars, Youngstown	19.50 to 20.00
Muck bar, Pittsburgh	27.00

RAILS AND TRACK MATERIAL

Stand. Bess., rails, Pbgh.	1.25c
Stand. open-hearth rails, Pbgh.	1.34c
Lgt. rails, 8-lbs., Pbgh. & Chgo.	1.22c
Lgt. rails, 12 lbs. Pbg. & Chgo.	1.17c
Lgt. rails, 16 to 20 lbs., Pgh. & Chgo.	1.12c
Lgt. rails, 25 to 45 lbs., Pbgh. and Chgo	1.07c
Relaying rails, standard, Pbg. & Chgo.	$23.00 to 24.00
Relaying rails, light, Chgo.	21.50 to 22.50
Angle bars, st. sect. Pbgh. base.	1.50c
Angle bars, st. sections, Chicago	1.50c
Spikes, railroad, Pbgh.	1.35c to 1.40c
Spikes, railroad, Chgo.	1.50c
Track bolts, Pbgh.	1.85c to 1.90c
Track bolts, Chgo.	2.00c

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:—	
Cleveland	$0.95
Newark, N. J.	3.00
New England	3.00
Philadelphia	2.79
Pittsburgh	.95
St. Louis	3.18
Buffalo to:—	
Albany, N. Y.	$1.26
New England (all rail)	2.58
New York and Brooklyn (all rail).	2.58
New York and Brooklyn (by canal)	1.00 to 1.50
Virginia furnaces to:—	
Boston docks (r. and w.)	$3.05
New England (all rail)	3.25
New York dock (r. and w.)	2.88
Birmingham, Ala., to:—	
Cincinnati	$2.90
Chicago	4.00
Cleveland	4.00
Louisville, Ky.	2.65
New York (all rail)	6.15
New York (rail and water)	4.25
Philadelphia (all rail)	5.20
Philadelphia (rail and water)	4.00
Pittsburgh	4.90
Savannah, Ga.	2.75
Chicago, to:—	
Des Moines	$2.80
Milwaukee	.50
Moline, Ill.	1.47
Omaha	3.58
St. Louis	1.58
Ironton and Jackson, O., to:—	
Chicago	$2.54
Cincinnati	1.26
Cleveland	1.62
Detroit	1.81
Indianapolis	1.58

SHAPES, PLATES AND BARS

Structural shapes, Pittsburgh	1.20c
Structural shapes, Chicago	1.39c
Structural shapes, Philadelphia	1.359c
Structural shapes, New York	1.369c
Struc. shapes, San Francisco	2.00c to 2.05c
Tank plates, Chicago	1.34c to 1.39c
Tank plates, Pittsburgh	1.15c to 1.20c
Tank plates, Philadelphia	1.359c
Tank plates, New York	1.369c
Bars, soft steel, Pittsburgh	1.20c
Bars, soft steel, Chicago	1.39c
Bars, soft steel, Philadelphia	1.359c
Bars, soft steel, New York	1.369c
Hoops, carloads, Pittsburgh	1.25c to 1.30c
Bands, Pittsburgh	1.20c
Shafting, Pbgh., carload prompt	68 to 70 per cent off
Shafting, Pbgh., contr.	68 per cent off
Screw stks., Pgh. carl'ds,	68 to 70 per cent off
Bar iron, Chicago	1.15c to 1.20c
Bar iron, Philadelphia	1.175c to 1.225c
Bar iron, New York	1.15c to 1.20c
Bar iron, Cleveland	1.20c to 1.25c
Bar iron, Pittsburgh	1.25c
Hard steel bars, Chicago	1.20c to 1.25c
Smooth finish, mchy. steey, Chi.	1.68c

SHEETS AND TIN PLATE

No. 28, black, Pittsburgh	1.80c to 1.90c
No. 28, black, Chicago	1.89c to 1.94c
No. 28, tin mill, black, Pbgh.	1.85c to 1.90c
No. 28, galvanized, Pbgh.	4.25c to 4.50c
No. 28, galvanized, Chgo., nom.	4.19c
No. 10, blue, anld., Pbgh. nom.	1.35c
No. 10, blue, annealed, Phila.	1.459c to 1.509c
Tin plate, 100 lb., coke base	3.10c to 3.20c

EXTRAS FOR SHEET OR TIN MILL SPECIFICATIONS

(Per hundred pounds.)

Single pickled, cold roll, and re-anl.	30 cents
Hot roll'd pickl'd and anl., tin mill	25 cents
Full pickl'd, cold rolled and re-anl.	50 cents
Auto sheets	75 cents
Blued stove pipe stock	10 cents
Range steel	30 cents
Re-squaring	10 cents
Roller leveling	10 cents
Patent leveling and re-squaring	35 cents
Oiling sheets	10 cents
Deoxidizing	10 cents
Lime finish	10 cents
Open-hearth stamping steel, free from mill scale	55 cents
Special open hearth deep stpg. steel free from mill scale	80 cents
Extra deep special auto body stock	$1.25
Ext. for 28 gage ov. 32 to 36-in. wide	10 cents

No reduction for sheets not annealed.

The above extras apply on both sheet and tin mill specifications, at the same rate.

IRON AND STEEL PIPE

(Pittsburgh.)

	Black. Butt-weld.	Galv. Butt-weld.
Steel, ¾ to 3 inches	79	63½
Iron, ¾ to 2½ inches	71	52
	Lap-weld.	
Steel, 2½ to 6 inches	78	62½

BOILER TUBES

Steel, 3½ to 4½ inches l. c. l.	74
Iron, 3½ to 4½ inches l. c. l.	62

WIRE PRODUCTS

(Retailers' price 5 cents above jobbers' quotation.)

Wire nails jobbers, Pittsburgh	$1.55 to 1.60
Plain wire, jobbers, Pittsburgh	1.35 to 1.40
Galvanized wire, jobbers, Pbgh.	2.15 to 2.20
Polished staples, Pbgh.	1.55 to 1.60
Galvanized staples, Pbgh.	2.35 to 2.40
Barb wire, painted, jobbers, Pbgh.	1.55 to 1.60
Barb wire, galv., jobbers, Pbgh.	2.35 to 2.40

IRON AND STEEL PRICES

Corrected up to Tuesday noon

BOLTS AND NUTS

(Delivered within 20-cent freight radius.)

Carriage bolts, ½ x 6 inches, smaller or shorter, rolled threads, 80 and 10; cut threads 80 and 5; larger or longer, 75 and 15.

Machine bolts with hot pressed nuts ½ x 4 inches, smaller or shorter, rolled 80 and 15; cut, 80 and 10; larger or longer, 80.

Gimlet and cone point lag or coach screws, 85.

Hot pressed square, blank or tapped nuts. $6.40 off list; hot pressed hexagon blank or tapped, $7.30 off.

Cold pressed square, blank or tapped, $6.10 off; hexagon, blank or tapped, ½ inch and larger, $7.50; ⅜-inch and smaller, $8.00.

RIVETS

Structural rivets, Pbgh	1.45c to1.50c
Structural rivets, Chgo	1.68c
Boiler rivets, Pbgh	1.55c to 1.60c
Boiler rivets, Chgo	1.78c

STEEL SHEET PILING

(Pittsburgh.)

Base sizes	1.55c to 1.60c

COLD ROLLED STRIP STEEL

(Subject to regular extras.)

0.10 to 0.19 Carbon.	Base price Cut to length Hard.	Soft.
1½ inch and wider		
0.100 and thicker	2.85	3.10
0.050 to 0.099 inc.	2.95	3.20
0.035 to 0.049 inc.	3.10	3.35
0.031 to 0.034 inc.	3.35	3.75
0.025 to 0.030 inc.	3.60	4.00
0.020 to 0.024 inc.	3.80	4.20
0.017 to 0.019 inc.	4.70	5.20
0.015 and 0.016	5.10	5.60
0.013 and 0.014	5.95	6.45
0.012	6.55	7.05
0.011	6.90	7.40
0.010	7.25	7.75
	Coils.	
0.100 and thicker	2.75	3.00
0.050 to 0.099 inc.	2.80	3.05
0.035 to 0.049 inc.	2.95	3.20
0.031 to 0.034 inc.	3.10	3.50
0.025 to 0.030 inc.	3.20	3.60
0.020 to 0.024 inc.	3.30	3.70
0.017 to 0.019 inc.	3.60	4.10
0.015 and 0.016	4.00	4.50
0.013 and 0.014	4.70	5.20
0.012	5.05	5.55
0.011	5.40	5.90
0.010	5.75	6.25

CAST IRON WATER PIPE

Six to 48-in., Cleveland	23.75
Four-inch, Chicago	25.50
Six to 12 inches, Chicago	23.50
Large sizes, Chgo	23.00
Six-inch, New York	20.50 to 21.50
Four-inch, New York	21.50 to 22.50
Four-inch, Birmingham	20.50
Six-inch and larger, Birmingham	18.50

Gas pipe, $1 per ton higher than water.

WAREHOUSE PRICES

Steel bars, Chicago	1.65c
Steel bars, Cleveland	1.80c
Steel bars, Cincinnati	1.75c to 1.80c
Steel bars, Philadelphia	1.70c
Steel bars, New York	1.80c
Steel bars, St. Louis	1.70c
Iron bars, Chicago	1.65c
Iron bars, Cleveland	1.75c
Iron bars, St. Louis	1.65c
Iron bars, Cincinnati	1.70c to 1.80c
Iron bars, Philadelphia	1.55c
Iron bars, New York	1.65c to 1.70c
Hoops, Chicago	2.15c
Shapes and plates, Chicago	1.75c
Shapes and plates, Cleveland	1.90c
Shapes and plates, Cincinnati	1.85c to 1.90c
Shapes and plates, St. Louis	1.80c
Shapes and plates, Philadelphia	1.70c
Shapes and plates, New York	1.85c
No. 10 blue anl. sheets, Chgo	1.95c
No. 10 blue anl. sheets, Cleve	2.05c
No. 10 blue anl. sh. St. Louis	2.00c
No. 10 blue anl. sheets, Cinci	2.00c
No. 28 black sheets, Chgo	2.45c
No. 28 black sheets, Cleveland	2.45c
No. 28 black sheets, Cincinnati	2.45c to 2.55c
No. 28 black sheets, St. Louis	2.55c
No. 28 galv. sheets, Chgo	4.85c
No. 28 galv. sheets, Cleveland	4.60c to 5.00c
No. 28 galv. sheets, Cincinnati	3.40c to 3.55c
No. 28 galv. sheets, St. Louis	3.75c

Freight Rates, Coke

Connellsville regions, per 2,000 lbs., to:—	
Baltimore	$1.80
Buffalo	1.85
Chicago	2.50
Cleveland	1.60
Detroit	2.10
East St. Louis	2.80
Joliet	2.50
Louisville	2.50
Milwaukee	2.70
New York	2.85
Philadelphia	2.05
Pittsburgh	.75
Richmond, Va.	2.94
Toledo	1.85
Valley Furnaces	1.20
Cincinnati	2.00

IRON AND STEEL SCRAP

(Net Tons.)

No. 1 railroad wrought, Chgo.	$ 8.75 to 9.25
No. 1 railroad wrought, Cleve.	9.25 to 9.50
No. 1 railroad wrought, St. L.	7.75 to 8.00
No. 1 railroad wrought, Cincin.	7.50 to 8.00
No. 2 railroad wrought, Chgo.	8.25 to 8.50
No. 2 railroad wrought, St. L.	7.25 to 7.50
Arch bars and transoms, Chgo.	12.00 to 12.50
Arch bars and transoms, St. L.	10.50 to 11.00
Knuckles, coup. & spr'gs, Chgo.	8.75 to 9.00
Knuckles, coup. & spr'gs, St. L.	8.00 to 8.50
Shafting, Chicago	11.75 to 12.25
Shafting, St. Louis	10.50 to 11.00
Steel car axles, Chicago	10.00 to 10.25
Steel car axles, St. Louis	10.00 to 10.25
Locomotive tires, Chicago	8.50 to 9.00
Locomotive tires, St. Louis	8.75 to 9.00
Cut forge, Chicago	8.25 to 8.50
Pipes and flues, Chicago	6.25 to 6.75
Pipes and flues, Cleveland	7.25 to 8.00

Freight Rates, Finished Material

From Pittsburgh, carloads, per 100 lbs. to:—	
New York	16.9 cents
Philadelphia	15.9 cents
Boston	18.9 cents
Buffalo	11.6 cents
Baltimore	15.4 cents
Cleveland	10.5 cents
Cincinnati	15.8 cents
Chicago	18.9 cents
Minneapolis and St. Paul	32.9 cents
Denver	68.6 cents
St. Louis	23.6 cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast, (all rail)	80 cents
Pacific coast, via Panama canal	61.9 cents

Pipes and flues, St. Louis	6.00 to 6.25
No. 1 cast, Chicago	9.00 to 9.25
No. 1 cast, Cleveland	10.00
No. 1 cast, Cincinnati	8.50 to 9.00
No. 1 cast, St. Louis	8.75 to 9.00
No. 1 busheling, Chicago	7.25 to 7.75
No. 1 busheling, Cleveland	8.50 to 8.75
No. 1 busheling, Cincinnati	6.00 to 6.50
No. 1 busheling, St. Louis	6.75 to 7.00
No. 2 busheling, Chicago	6.00 to 6.50
No. 1 boiler plate, cut, Chgo	5.50 to 5.75
No. 1 boiler plate, cut, St. L.	5.25 to 5.50
Boiler punchings, Chicago	8.25 to 8.75
Cast borings, Chicago	5.25 to 5.50
Cast borings, Cleveland	6.00 to 6.25
Cast borings, Cincinnati	4.75 to 5.25
Cast borings, St. Louis	5.25 to 5.50
Machine shop turnings, Chicago	5.00 to 5.50
Machine shop turnings, Cleve	5.75 to 6.00
Machine shop turnings, Cinci	$ 4.25 to 4.75
Machine shop turnings, St. L.	5.50 to 5.75
Malleable agricultural, Chicago	7.50 to 7.75
Malleable agricultural, St. Louis	5.50 to 6.00
Malleable, railroad, Chicago	8.00 to 8.50
Malleable, railroad, Cincinnati	6.00 to 6.50
Malleable, railroad, St. Louis	6.25 to 6.50
Angle bars, iron, Chicago	11.75 to 12.25
Angle bars, iron, St. Louis	10.00 to 10.50
Angle bars, steel, Chicago	8.25 to 8.50
Angle bars, steel, St. Louis	8.00 to 8.25
Stove plate, Chicago	7.75 to 8.00
Stove plate, Cleveland	8.00 to 8.25
Stove plate, Buffalo	8.25 to 8.75
Stove plate, Cincinnati	6.00 to 6.50
Stove plate, St. Louis	6.00 to 6.25
Bundled sheet, Cincinnati	4.75 to 5.25

(Gross tons.)

Heavy melting steel, Pbgh	$11.75
Heavy melting steel, Buffalo	10.50 to 11.00
Heavy melting steel, Chgo	9.25 to 9.50
Heavy melting steel, Cleveland	10.25 to 10.75
Heavy melting steel, Cincinnati	8.50 to 9.00
Heavy melting steel, eastern Pa.	11.00 to 11.25
Heavy melting steel, New York	8.75 to 9.00
Heavy melting steel, St. Louis	9.00 to 9.50
Grate bars, Buffalo	9.00 to 9.50
Grate bars, New York	6.50 to 7.00
No. 1 railroad wrought, east. Pa.	12.50 to 13.00
No. 1 railroad wrought, Pbgh	10.25
No. 1 R. R. wrght., New York	10.50 to 11.00
No. 1 R. R. wrought, Buffalo	10.50 to 11.00
Shafting, New York	13.00 to 13.50
Shafting, eastern Pa.	15.00 to 15.50
Wrought pipe, New York	8.25 to 8.50
Wrought pipe, eastern Pa.	10.50 to 10.75
Mch. shop turnings, New York	6.00 to 6.25
Machine shop turnings, Buffalo	5.75 to 6.25
Mch. shop turnings, Pbgh	8.00 to 8.25
Mch. shop turnings, eastern Pa.	8.25 to 8.50
Cast borings, New York	6.00 to 6.25
Cast borings, eastern Pa.	8.25 to 8.50
Cast borings, Buffalo	6.50 to 6.75
Cast borings, Pittsburgh	8.50 to 8.75
Stove plate, N. J. points	8.50 to 9.00
Stove plate, Pittsburgh	8.25 to 8.75
Stove plate, eastern Pa.	9.00 to 9.50
Shoveling steel, Chicago	8.75 to 9.50
Shoveling steel, St. Louis	8.00 to 8.25
Reroll. rails, 5 ft. & ov., Pbgh.	12.00 to 12.50
Reroll. rails, 5 ft. & ov., Chgo.	10.00 to 10.50
Reroll. rails, 5 ft. & ov., Cleve.	10.50 to 11.00
Reroll. rails, 5 ft. & ov., E. Pa.	11.50 to 12.00
Reroll. rails, 5 ft. & ov., St. L.	10.00 to 10.25
Steel rails, short, Chicago	10.00 to 10.50
Steel rails, short, Cleveland	11.75 to 12.00
Steel rails, short, St. Louis	9.25 to 9.50
Iron rails, Cleveland nom.	11.75 to 12.00
Iron rails, Chgo	12.00 to 12.50
Iron rails, Cincinnati	10.25 to 10.75
Iron rails, St. Louis	10.00 to 10.50
Iron rails, Pittsburgh (nom.)	12.50 to 13.00
Frogs, switches, guards, Chgo.	9.25 to 9.50
Frogs, switches, guards, St. L.	9.00 to 9.25
Car wheels, (iron), Pittsburgh	11.50
Car wheels, (steel), Pittsburgh	12.25 to 12.50
Car wheels, Chicago	9.75 to 10.00
Car wheels, eastern Pa.	10.75 to 11.25
Car wheels, Buffalo	10.00 to 10.50
Car wheels, N. J. points	9.50 to 9.75
Car wheels, St. Louis	9.75 to 10.00
Iron axles, Pittsburgh	17.50
Iron axles, Cincinnati	19.00 to 20.00
Iron axles, eastern Pa.	18.50 to 19.00
Iron axles, Chicago	15.25 to 15.75
Iron axles, Buffalo	16.00 to 16.50
Iron axles, St. Louis	13.50 to 14.00
Steel car axles, New York	13.50 to 14.00
Steel car axles, Buffalo	12.00 to 12.50
Steel car axles, Cleveland	12.00 to 12.50
Steel car axles, eastern Pa.	14.00 to 14.50
No. 1 busheling, Buffalo	8.50 to 9.00
No. 1 busheling, Pittsburgh	9.75 to 10.00
No. 2 busheling, Buffalo	6.50 to 7.00
Low phosphorus steel, Buffalo	12.50 to 13.00
Low phosphorus steel, Pbgh	14.75 to 15.00
Low phos. steel, eastern Pa.	14.50 to 15.00
No. 1 forge, eastern Pa.	8.50 to 9.00
No. 1 cast, eastern Pa.	12.00 to 12.50
No. 1 cast, Pittsburgh	11.75 to 12.00
No. 1 heavy cast N. J. points	11.25 to 11.50
Mall. railroad, Cleveland	10.25 to 10.50
Malleable railroad, Pittsburgh	10.00
Malleable railroad, Buffalo	9.50 to 10.00
Malleable railroad, east Pa.	9.25 to 9.75
Bundled sheet, Pittsburgh	9.00
Bundled sheet, Cleveland (nom.)	8.50 to 9.00
Bundled sheet, Buffalo	7.00 to 7.50

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Corrosion Resistance Discussed

(*Continued from page* 1165)

sheets are too thin to yield fair comparative results under varying weather exposure conditions. I have never been able to get even the cheapest and most ordinary steel sheets to rust through in the same length of time in which Mr. Buck's best analysis sheets failed, although I have had them out under very severe conditions of exposure. I am, therefore, led to the belief that the tests described are not conclusive.

At my original suggestion, the corrosion committee of the American Society for Testing Materials is about to undertake a series of systematic weather exposure tests on large corrugated sheets of16 and 22-gage iron and steel of all types now available in the open market. These sheets are not to be pickled and only a portion of the heavier gage are to be sand-blasted. Until these authoritative and unbiased tests can be reported on, it is my belief that such sweeping claims as Mr. Buck has made in his paper are quite unjustified. My own opinion, based on what I consider the most reliable data yet available, is that in metals, as in food, purity is the safest criterion of excellence.

Forthcoming Meetings

American Foundrymen's Association.—A. O. Backert, secretary, Penton building, Cleveland. Convention Sept. 27, Oct. 1, Marlborough-Blenheim hotel, Atlantic City.

American Hardware Manufacturers' Association.—F. D. Mitchell, secretary, 1510 Woolworth building, New York.

American Institute of Electrical Engineers.—F. L. Hutchinson, secretary, 33 West Thirty-ninth street, New York. Next meeting at San Francisco, Sept. 16-18. Pittsburgh section, Charles R. Riker, secretary, 200 Ninth street; regular meetings second Tuesday of each month, Oliver building.

American Institute of Metals.—W. M. Corse, secretary, 106 Morris avenue, Buffalo. Atlantic City, Sept. 27 to Oct. 1.

American Institute of Mining Engineers.—Bradley Stoughton, secretary; Albert Sauveur, chairman of Iron and Steel Committee, 29 West Thirty-ninth street, New York. Next meeting at San Francisco Sept. 16-18.

American Iron and Steel Institute.—James T. McCleary, secretary, 30 Church street, New York. Spring meeting, New York, May 28-29.

American Railway Engineering Association.—E. H. Fritch, secretary, 900 South Michigan avenue, Chicago. Annual meeting, March 21-23, 1916, at Chicago.

American Railway Master Mechanics' Association.—J. W. Taylor, secretary, Karpen building, Chicago. Atlantic City, June 9-11.

American Railway Tool Foremen's Association.—Owen D. Kinsey, secretary, 7223 Ridgeland avenue, Chicago, Hotel Sherman, Chicago, July 19-21.

American Society of Civil Engineers.—C. W. Hunt, secretary, 220 West Fifty-seventh street, New York. Regular meetings at New York, first and third Wednesday of each month, except June and August. Meeting at San Francisco, Sept. 16-17.

American Society of Mechanical Engineers.—Calvin W. Rice, secretary, 29 West Thirty-ninth street, New York. Spring meeting, Buffalo, June 22-25. Special fall meeting, San Francisco, Sept. 16-17.

American Society for Testing Materials.—Prof. E. Marburg, secretary, University of Pennsylvania, Philadelphia. Next meeting June 22-26, at Hotel Traymore, Atlantic City, N. J.

Association of Iron and Steel Electrical Engineers.—W. T. Snyder, secretary, National Tube Co., McKeesport, Pa. Regular meeting first Saturday of each month, Seventh Avenue

Hotel, Pittsburgh. Annual convention, Hotel Statler, Detroit, Sept. 8-11.

Chicago Foundrymen's Club.—C. E. Hoyt, secretary, Lewis Institute, Chicago. Regular meetings second Saturday of each month.

Engineers' Society of Western Pennsylvania.—Elmer K. Hiles, secretary, Oliver building, Pittsburgh. Regular meeting, third Tuesday and section meeting first Tuesday of each month.

International Engineering Congress.—San Francisco, Sept. 20-25.

Lake Superior Mining Institute.—A. J. Yungbluth, secretary, Ishpeming, Mich. Next meeting on Gogebic range, in August.

Master Car Builders' Association.—J. W. Taylor, secretary, Karpen building, Chicago. Atlantic City, June 14-16.

National Founders' Association.—W. H. Barr, president, Lumen Bearing Co., Buffalo; J. M. Taylor, secretary, Chicago; A. E. McClintock, commissioner, Chicago. Annual convention, Hotel Astor, New York, Nov. 17 and 18.

National Hardware Jobbers' Association.—F. D. Mitchell, secretary, 1510 Woolworth building, New York.

National Machine Tool Builders' Association.—Charles E. Hildreth, general manager, Worcester, Mass.

National Metal Trades Association.—J. D. Hibbard, commissioner, Chicago.

New England Foundrymen's Association.—Fred F. Stockwell, secretary, 205 Broadway, Cambridgeport, Mass. Regular meetings, second Wednesday of each month, at Exchange Club, Boston, except June, July and August.

Philadelphia Foundrymen's Association.—Howard Evans, secretary, Pier 45 North, Philadelphia. Regular meetings, first Wednesday of each month, at Manufacturers' Club.

Pittsburgh Foundrymen's Association.—F. H. Zimmers, secretary, Pittsburgh. Regular meetings, third Monday of each month, Fort Pitt Hotel, Pittsburgh.

Railway Supply Manufacturers' Association.—Atlantic City, June 9-16.

Society of Automobile Engineers.—C. F. Clarkson, secretary, 1745 Broadway, New York. Summer meeting, June 14-17, on board steamer Noronic, leaving Detroit, June 14.

Superintendents' and Foremen's Club of Cleveland.—Philip Frankel, secretary, 310 New England building, Cleveland. Meeting subject to call of executive committee.

Western Society of Engineers.—J. H. Warder, secretary, 1735 Monadnock building, Chicago. Regular meetings, first Monday of each month, except July and August, in Monadnock building.

The Meehan Boiler Co., Lowellville, O., has received a contract for two stacks, 5 feet and 6 feet in diameter and 125 feet tall for the new open hearth steel plant of the Youngstown Iron & Steel Co.

H. Edsil Barr, Erie, Pa., has issued an interesting booklet describing his system of construction for industrial buildings. The booklet covers the various features of the Barr System thoroughly and includes a large number of illustrations showing buildings, in various stages of construction, which have been erected by this system.

The University of Minnesota, School of Mines, has issued a series of large scale maps of the mining district of Minnesota, including the Mesabi, Vermillion and Cuyuna ranges. These maps, which are in sectional form, are of sufficient size to show accurately the location of every mine, and tables are presented giving the ownership of the various properties.

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HELP WANTED:—SALESMAN ON 40 per cent commission basis to handle new $6 boring tool which sells on sight. Address Box 446, THE IRON TRADE REVIEW, Cleveland, O.

WANTED:—STRUCTURAL STEEL TEMplet makers, layerout and fitters required for structural shop, Havana, Cuba. Forward applications at once, stating experience, qualifications and references, to George Walsh, Superintendent, American Steel Co. of Cuba, Havana, Cuba.

WANTED — ELECTRIC ARC WELDER for steel tanks. Must be able to take charge of welding department. Address Box 459, THE IRON TRADE REVIEW, Cleveland.

WANTED—CHECKER FOR ENGINEERING DEPARTMENT WITH EXPERIENCE ON HEAVY MACHINERY. MAN WITH ROLLING MILL EXPERIENCE PREFERRED. STATE AGE, SALARY EXPECTED AND REFERENCES. TREADWELL ENGINEERING CO., EASTON, PA.

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THE BEST WAY TO GET A GOOD POsition in drafting or engineering is to file an application direct with some of our clients who are depending on us to get competent and experienced applicants for their vacant positions. Send stamp for blank and list of vacant positions. The Cleveland Engineering Agency Co., Rose building, Cleveland, O.

Positions Wanted

WANTED: — POSITION AS FOUNDRY superintendent or foreman; 22 years as foundry foreman in gray iron, brass, semi-steel and cupola; up to date on machinery molding and general foundry work; sober and dependable with A-1 references. Address Box 455, THE IRON TRADE REVIEW, Cleveland, O.

A PATTERN MAKER OF 18 YEARS' experience, the last 11 of which as foreman, desires an executive position in one of the southern states. Satisfactory reference regarding mechanical ability, character and health cheerfully furnished. Address Box 454, THE IRON TRADE REVIEW, Cleveland, O.

CHEMIST AND METALLURGIST; AM 36; TECHNICAL GRADUATE; 12 YEARS STEEL MILL EXPERIENCE, FIVE YEARS MECHANICAL, FIVE CHIEF CHEMIST, TWO HEAD OF METALLURGICAL AND RESEARCH DEPARTMENT; FAMILIAR WITH CLAIM WORK. CAN LOCATE YOUR OPEN HEARTH, ROLLING, PICKLING, ANNEALING, TINNING OR GALVANIZING TROUBLES. BEST REFERENCES. ADDRESS BOX 452, THE IRON TRADE REVIEW, CLEVELAND, O.

Positions Wanted

FOUNDRY FOREMAN, HAVING BEEN in business and knowing the foundry business from the bottom up is looking for a position; up-to-date on cupolas, molding machines and economical production. Address Box 432, THE IRON TRADE REVIEW, Cleveland, O.

STEEL FOUNDRY FOREMAN, 15 years' experience in open hearth, converter and manganese steel castings, both green and dry sand. Address Box 333, THE IRON TRADE REVIEW, Cleveland, O.

EXPERIENCED PATTERN MAKER wishes position as foreman; over 10 years in charge of shops employing from 20 to 100 men making patterns for gas and oil engines and electrical machinery. Broad experience with molding machines. Address Box 253, THE IRON TRADE REVIEW, Cleveland, O.

STEEL FOUNDRY SUPERINTENDENT or general foreman; young man of unquestioned ability and character would like to connect with a firm offering a future. Address Box 434, THE IRON TRADE REVIEW, Cleveland, O.

STEEL FOUNDRY SUPERINTENDENCY by aggressive, competent man; crucible, electric or open hearth plants preferred. Expert knowledge of mixtures, melting, molding, casting and cost. Savings effected; refinements introduced. Address Box 410, THE IRON TRADE REVIEW, Cleveland, O.

PURCHASING AGENT AND COST accountant desires position; 32 years of age; 12 years' experience in large manufacturing plants. Highest references as to ability and character. Address Box 327, THE IRON TRADE REVIEW, Cleveland, O.

OPERATING SUPERINTENDENT AND efficiency executive of crucible, electric and open hearth steel plants and rolling mills, fully qualified by seventeen years successful plant management experience, desires position wherein practical metallurgical, producing, economic, statistical and financial experience are required. Address Box 409, THE IRON TRADE REVIEW, Cleveland, O.

MECHANICAL ENGINEER; TECHNIcal training; 18 years' experience gas engines, machine tools, mill buildings, hydraulic machinery, ordnance work; 14 years in charge of work; 6 years as superintendent; can fill position of superintendent or chief engineer; good references. Address Box 341, THE IRON TRADE REVIEW, Cleveland, O.

BLAST FURNACE SUPERINTENDENT who can produce results wishes position. Preferably with company manufacturing Bessemer or Basic for own steel plant. References furnished. Address Box 441, THE IRON TRADE REVIEW, Cleveland, O.

POSITION WANTED — BY MECHANical engineer having 20 years experience as a machinist, tool-die maker, general metal manufacturing line, also drafting, thoroughly understands systematizing so as to get the highest efficiency at the minimum cost. Age 35. At present holding executive position. Address Box 450, THE IRON TRADE REVIEW, Cleveland, O.

POSITION WANTED—BY MECHANICal engineer having 22 years experience as a mechanic in the steel line, thoroughly understand the heat treatment of Alloy, Carbon and High Speed Steels. At present employed as mechanical engineer, desires position in the Steel or Machinery line. Address Box 451, THE IRON TRADE REVIEW, Cleveland, O.

Positions Wanted

IRON METALLURGIST, CHEMIST, metallographist, 8 years iron and steel experience, desires foundry position in charge of cupolas, efficiency and safety work. Successful executive with initiative ability; now handling 40 men on a scientific management basis. Married; age 36. Location middle west or south. Address Box 457, THE IRON TRADE REVIEW, Cleveland, O.

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PATTERN MAKER FOREMAN; SIX years experience; wishes to make change. Experience in pump and engine works, etc. Address Box 453, THE IRON TRADE REVIEW, Cleveland, O.

GRADUATED MECHANICAL ENGINEER, 32 years, with 3 years shop experience and 8 years as designer in car work, rolling mill and steel plant work, desires position as assistant master mechanic or assistant mechanical engineer, in taking care of repair work, or smaller engineering office. At present employed in Pittsburgh district. Best of ability and character references furnished. Address Box 438, THE IRON TRADE REVIEW, Cleveland, O.

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